

ASTOUNDING



SCIENCE-FICTION

A STANTON & THORNTON PUBLICATION

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SEPTEMBER

**FORCES MUST
BALANCE!**

by

Mandy Walker Weisman

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VOL. XXIV NO. 1

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The Open House of Controversy.

Illustrations by Isip, Kall, Mayan, Orben, Schneeman and Wesso

COVER BY ROGERS

ON SALE
FOURTH FRIDAY
EACH MONTH
\$2 per YEAR
22c per COPY

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STREET & SMITH PUBLICATIONS, INC. • 79 7th AVE., NEW YORK, N. Y.

ENDING YEAR SIX

With this month's issue, Street & Smith end the sixth year of their management of *Astounding*. With next month's issue, we begin the seventh year. It is with considerable pride that we point out that *Astounding* has now been the leader in its field for five full years, since it, as a Street & Smith magazine, first hit its full stride. Further, it now stands as the science-fiction magazine longest under the directorship of the house now publishing it.

The past year has seen improvements, as I promised twelve months ago, that it would. In the twelve months that are to come, more changes will, inevitably, be made. It is impossible for a magazine in this field to retain its position by standing still; as the Queen told Alice in *Wonderland*, "In this country, you have to run as hard as you can to stand still!"

Astounding continues to lead because it advances a bit faster. In the last twelve months we have introduced a number of new authors; so have others. But a high percentage of those new authors we have introduced have risen immediately to unquestioned top-rank names. In *Astounding*, a story appearing over a hitherto unknown name is more apt than not to be one of the outstanding stories of the issue. H. L. Gold—John Berryman—A. E. van Vogt—and, I'm willing to predict, Don Evans, appearing for the first time in the science-fiction field in this issue.

It isn't the stories of these new men alone that are important; with each injection of a fresh, strongly developed and strongly presented viewpoint, which these new authors represent, the old familiars, with their wider experience in the field to draw on, see new and advantageous methods of presentation they can add to their own material. It isn't alone—or even largely—the great idea that makes a great story; it's the forceful presentation of that thought that makes it live for the reader, and that depends on methods of presentation, skill in handling of material, on the logical, clear organization of the material.

In this year, too, *Astounding* and *Astounding's* background gave rise to *Unknown*; not merely another science-fiction magazine, but an offshoot of the imaginative field, handling a type of material different in character from that appearing in *Astounding*, yet arising in the same fundamental of imagination.

In this year, our science articles have gained in popularity as they gained in quality and interest. Incidentally, I feel that our current "The Other Side of Astronomy" is one of the most thoroughly interesting and amusing articles on astronomers that has appeared anywhere. Willy Ley's article on electric batteries of two thousand years ago was reprinted in several straight-science digests; I suspect that astronomy article may be also.

Perhaps the most visible changes in the past year have been in the artwork. New artists have been introduced, put on trial before the readers, and a selection

on the basis of reaction is still in progress. Schneeman has developed a new technique of presentation in black and white that begins in the current "Forces Must Balance," and will surprise you, I think, in the illustrations he has done for Smith's great work, "Gray Lensman." We've introduced Graves Gladney and Hubert Rogers on the covers; both seem to have been well liked, and will appear in the future.

Schneeman's Saturn astronomical cover was among the best-liked of the past year; the next astronomical cover, showing Uranus, will come soon. When it appears, we will arrange that no printing overlaps any portion of the picture itself.

Astounding's field, however, is not review but forecast; the coming rather than the past. We had some bull's-eyes in the last year—atomic power possibilities coming up. Like most prophets, we missed a few, too.

But here is one basic prophecy that is inherent in our modern civilization; the more thoroughly Man and Science tame Nature, the more influence on environment technology has and the less Nature exerts, the more accurate can predictions in general become. You can't accurately forecast the cotton crop of 1940, because a drought can ruin it, and cannot be predicted. But the production of rayon in 1940 is predictable, because a chemical plant doesn't worry particularly about the state of the weather.

Even immensely important discoveries such as atomic power are slow in making themselves felt, and can be worked into the scheme of things gradually when they develop. It will be not less than a full decade before a full-size, practical atomic power plant can be attained. Probably the first big commercial installations are between fifteen and twenty years away. That is the lag that caution and sound engineering will require. That is the lag between Kitty Hawk and the Yankee Clipper.

But for us, and for the immediate year—

We begin the seventh year of Street & Smith's Astounding next month with a definite augury for the coming year, I feel. Dr. E. E. Smith's "Gray Lensman" begins in that issue. To anyone who has read Dr. Smith's work, it is unnecessary to explain the importance of that; to those who have begun reading science-fiction too recently to know two-years-to-a-story-Smith's material, the constant demand for his stories appearing in the readers' department have given some preparation.

So long is "Gray Lensman" that, divided into installments of the usual length, it would run not the usual half year, but a full eight months. We are going to run "Gray Lensman" in four installments; they will be *long* installments. Judging solely by past experience, science-fiction novels seldom appear in book form. Further, back copies containing Smith stories disappear from the market quickly. We suggest that, if you miss "Gray Lensman" now, you'll miss it for a long time.

And regret it equally long.

THE EDITOR.



Who is the
AVENGER?

HIS wife and daughter were killed by mobsters on a plane trip to Canada.

He was dropped from the plane. He woke in a hospital—his dark hair turned white—his facial muscles paralyzed—his blue eyes gleaming vengeance!

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FORCES MUST BALANCE!



By MANLY WADE WELLMAN

THE Martian night could not dim the garish glory of Pulamhar, City of Pleasure. Though all the rest of drought-ridden Mars struggled and schemed to gather and hoard precious water, Pulamhar rose on stilts

from a silver lake, even as old Venice, jewel of Earth, rose from the salt sea. Venetian, too, were the swarms of gondola-like boats—strange pleasure vehicles from Earth, brought to provide a curious thrill—which floated or plied on the

waterways. Platforms and promenades, a few feet above the lake surface, blazed with lights as bright as day. Throngs of holidaying folk strolled on foot, soared on helicopters, or rode in little purring cars, eyes beset by glitter, ears filled with music and laughter. There were theaters, cafés, museums of curiosities from every planet. No pleasure known to the universe was lacking. No person in all the city but was joyful—none but Burr Wingate.

He stood far above, his slim young body leaning easily upon a narrow bridge of metal cables—one of the many that hung like strands of a web upon the tops of Pulambar's highest towers. Above him was only the night and the two hurtling Martian moons, and beneath him, like a map, spread the roofs and walls and streets of the carnival city. The water lanes seemed no wider than his long white forefinger, the boats and the people like bobbing nutshells and loitering ants. Now and then a strain of music mounted up to him. The light of the streets was faint as it washed upward and showed his face, pale and slightly frowning.

"A long way down," he was mumbling. "The longer, the better. Here goes!"

Through the back of his consciousness raced images and memories: his childhood, wealth-pampered; his schooling at home on Earth and more recently in the Martian Government University at Ekadome; his meeting with the entirely uneducated but highly ingenious gentleman with a "mine" to sell. That had been his undoing. That, and the fact that his highly elaborate and wholly inapplicable education did not include practical, salable experience. It included lots of philosophy, but Wingate's philosophy didn't include the kind of work he was able to get as easily as it included the obvious and instant finish of death.

He placed his hands on the low railing

and bent his legs for a leap.

"Wait!"

Someone was rushing along the bridge toward him. "No, you don't!" Burr Wingate yelled back, and vaulted over into the abyss. He stared down upon all Pulambar, the gleaming, churning chart. Why didn't it rush up to meet his fall? But he wasn't falling.

A hand had caught his collar, even as he flung himself.

On Earth, his weight might have whipped his rescuer over the rail and down to destruction with him. Even with the lesser gravity of Mars, Wingate weighed a good sixty pounds. Only a strong man could make such a one-handed catch and not be forced to let go. But the hand on Wingate's collar gave a powerful heave, the cable bridge swayed and swung in the height like a hammock, and the would-be suicide found himself standing on the metal cleats once more, looking into a dark, heavy face and eyes full of burning scorn. The grip on his collar shook him, as though he were a naughty child.

"Ye're a sorry fool!" accused a deep, harsh voice.

"Thanks for nothing," snapped Wingate, struggling to get away. "Take your hands off me."

"Not so fast, lad," and the fingers tightened. "I'm not letting ye jump again. It would be long before ye hit bottom."

"The time would pass quickly enough," grumbled Wingate, and the other laughed—a surprising bark of a laugh, brief but hearty.

"Come, things can't be so bad if ye can make jokes. Come, I say."

The big man shoved him along the bridge to the end tower. "My quarters are just below here," he explained. "Lucky they're so, and I went out for a walk before bed, or ye'd have been so much jelly by now. Come down and talk it out."

AN AUTOMATIC elevator carried them downward a dozen levels, and Wingate's rescuer half led, half thrust him along a corridor and finally into a small, metal-paneled sleeping room, with two chairs and a cot. Into one chair he pushed Wingate, and, placing the other against the door, lowered his square-turned bulk into it. One hand rose to rub a heavy, smooth-shaven chin.

"Why do ye want to die?" he inquired.

"That's my business," snapped Wingate.

Black, wide-set eyes studied Wingate carefully. "Ye're young. Healthy, though soft. I'd judge ye had wealth—yer clothes are good but need pressing. That narrows down the field of reasons; on a venture, I'd say ye'd lost the wealth."

Wingate stared, then nodded angrily.

Again the short laugh, gentler. "Ye didn't think it over, lad. Suicide won't get it back."

"Naturally," Wingate snorted. "But I'm not so stuck on life that I'd take the stinking jobs they'll give a man without experience for the next fifty years, just so I can live for no purpose."

"Then come with me! If ye value life so lightly, risk it on a real venture. Be off over the fence for a new world—the newest—the planet Ulysses!"

"Ulysses," repeated Wingate, slowly comprehending. "The thing they call the Wandering World. The planet that's wandering into the System from outer space, the unclaimed, unowned world—"

Wingate knew about Ulysses, as did almost everyone on the habitable planets, and his big companion went on: "Ships from every government—Mars, Earth, Venus, the Jovian System—are going to rush for it." He grinned, as if in relish of the idea. "Zero Hour is noon, Mars time, at Pulambar day after tomorrow. Ships take off. First to reach Ulysses

claims him—right of first touch, you know."

Wingate looked at the broad, vital face opposite him. "Well then?" he prompted. "Where do you fit in? What's your name?"

"I saved yer life, lad; I'll put ye on yer honor not to betray me. I'm Duke Hudspeth."

"Duke Huds—" Wingate broke off, and stared.

"Ye've heard of me, I take it. Yes, Duke Hudspeth; outlaw, vagabond, wanted on every planet, by every government police, for any one of a dozen crimes—espionage, flying without license, dueling, and so on. My secret's yers, now, and by the token ye must go with me." He paused, to let it sink in. "For I'm going to Ulysses—beating all the worlds there—I'll set foot on free, safe land, where no government can touch or trouble me. I've a ship taking off at Zero Hour, and a crew of sorts—men like me, who can't afford to lose. One more hand is welcome aboard. That's why I snatched ye back to life."

"But . . . but . . . I don't think I want—"

"No?" Duke Hudspeth rose hugely, and kicked his chair away from the door. "But I can't leave ye behind. Ye'll join me—yer word of honor this instant, or I drop ye from the bridge."

Wingate realized, in wonder, that the fit had passed from him. He did not want to die. He nodded in acceptance of the terms.

Hudspeth chuckled, and from a cupboard drew a bottle. "Drink to it, then. No Martian slop, though—this is plain, good whiskey. Hold yer tumbler steady. Now, to a winning blast!"

The spirit stung Wingate's unaccustomed palate, but it helped compose his nerves. He listened with some calm to Duke Hudspeth's lecture about Ulysses, and how to get there. Finally he ventured a question himself:

"Is it true, Hudspeth, that the charge

of murder against you on Earth is really trumped up—that you killed in defense of government secrets, and that the Secret Service had to have a scape-goat—”

“I’ll keep such tales for the long flight,” Hudspeth broke him off. “I see the whiskey has taken hold on ye. Sleep, lad, on that cut.”

Wingate moved toward the bed. A window was open—on a sheer drop of more than two thousand feet. “Where do you sleep?” he asked Hudspeth.

“Elsewhere,” was the brief response, and Hudspeth was gone. The lock clinked shut behind him.

II.

WINGATE did not even try the door. He went to the window again and peered out. He was almost as high above Pulambar as he had been on the bridge, and there was no apparent handhold or foothold on the steep cliff of the wall.

Burr Wingate stripped a coverlid of elastic fabric, tried its spring by pulling a length between his hands. Again he gazed from the window, noted other windows below—far below, but not too far. Then from his pocket he drew a claspknife, with a blade of sharp white steel. Quickly he cut the elastic coverlid to strips, knotted them, and finally hung the improvised line from his window. The upper end he made fast to a projecting lamp bracket. Full sixty feet the elastic cord dangled, into nothingness; and he, Burr Wingate, was going to climb down and to safety.

He was no athlete, but again there was the reduced gravity of Mars to consider. His poundage was little more than a third of what it would be on Earth—the climb would be easy. Duke Hudspeth, the interplanetary outlaw, would never see him again, except in a court of law. Hudspeth had been a fool to place such trust in him, to tell all that

thrilling and incriminating tale of fluster-busting flight. Wingate knew where a recital of the plan would win him an interested audience. Carthage Dawes, a friend since college on Earth, was connected with the Earth expedition to Ulysses. Out of the window he swung, and down the cord like a monkey.

He descended to one window—a dark one. Another sill he reached, found the room inside lighted and empty, but the window locked. Another dark window, another and another. He came to his line’s end.

But beneath him showed a rectangle of light—a window, and apparently open. He swung hard upon the line. It gave, lowered him, and then drew him buoyantly up. Again he went down—farther this time—gained the sill and caught the inner frame of the window, letting go of the elastic, which snapped upward.

The room outside which he perched had four revelers for occupants. Two were flower-headed Martians and two of them Terrestrials, lounging under the flickering light of a portable joy-lamp, excited nervously by its rays as by a narcotic. Clinging outside, Wingate tapped on the half-raised pane of glassite.

There was a startled chorus of exclamations, and someone turned the joy-lamp off. One of the Terrestrials as beefy big as Duke Hudspeth, came and stared at Wingate. “What’s up?” he demanded apprehensively.

Wingate smiled, and pointed upward with his free hand. “I’m leaving a room rather hurriedly,” he improvised readily. “Too much company coming. Let me out through here.”

The other grinned and helped him in—it was the kind of story that would at once reassure and intrigue such pleasure-seekers. Wingate was congratulated, given a drink of Jovian guil, spicy and bracing, and sent on his way.

Down by elevator, along the thronged

street of music, light and laughter by surface car; and to the dimmer outskirts of Palambar where, in her father's villa, he had bade Carthage Dawes good-by.

Wingate pressed the summons button at the outer gate, and on the small oblong of the television screen appeared a pink chrysanthemum-head on robed shoulders—a Martian butler. "Yess?" he intoned in his artificial larynx.

"Burr Wingate to see Miss Carthage Dawes," replied the visitor.

"Miss Dawess iss not herre," said the servitor.

Wingate frowned. "Tell her that I must see her."

"Miss Dawess hass rreturned to her native Earrth," the Martian assured him.

"But it's frightfully important—" began Wingate, and then the Martian's image winked out, and another head appeared in the vision screen; a grizzled Terrestrial head, that of Samuel Dawes, the father of Carthage.

"Oh, hello, Wingate," said the voice of Samuel Dawes. "You want to see Carthage? But haven't you heard? She's gone back to Earth. I was against the idea at first, but she persuaded me and the League Committee both; and now I'm proud—"

"In Heaven's name, what is all this?" broke in Wingate.

"Why, Carthage is going to command Earth's entry in that run to Ulysses!" the father informed him jubilantly. "Girl or not, she's well up to it. I've trained her myself, from babyhood. You appear stunned, Wingate."

"I . . . I am," confessed the youth.

"Perhaps you'd like to talk to her—I have her on the interplanetary televiso just now. Wait, I'll switch you on."

AGAIN a blink, a flash, a new face—a lovely, radiant oval one, with level green eyes and tawny-red hair under an embroidered fillet. "Hello, Burr, and good-by," said the voice of Carthage.

"I'm off in a day for the big rocket flight of all time. The race to Ulysses, and I'm going to win—for Earth!" Her voice was not tense, but definitely excited.

"Carthage," said Wingate, "I came to tell you news of the greatest importance." He drew in his breath. "Have you ever heard of Duke Hudspeth?"

"Who hasn't?" said the image of Carthage Dawes. "We've looked everywhere for him."

"I know. The police of every planetary government—"

Carthage's image shook her red head. "No. Whatever the charges are against him, Hudspeth is one of the greatest space-fliers in history. We don't want to arrest him. Earth would have given him full pardon to secure him as second-in-command of the Terrestrial entry."

"Hudspeth's an outlaw," protested Wingate. "And I can—"

"Hudspeth," replied Carthage, "is a gentleman. A bit unconventional, a bit too rugged an individualist—but a gentleman. If he gave us his promise to help, he'd keep it. His bad luck and bad reputation, I think, come from trusting others too much, getting into jams because of them. What do you know about Hudspeth, Burr?"

"As a matter of fact," she went on, "my only fear in this race is that Hudspeth may be flying for some other government. I feel that he alone can outrun Earth's entry—the finest ship and the best crew."

Wingate felt his lips twitching, but controlled them. A new thought struck him. He had come here to betray Hudspeth's secret, but Carthage had put a new and more favorable light on the man's character. Very well, Hudspeth would get the chance. Wingate would leave the story untold, would return and help Hudspeth as he had promised. If, as she said, he was simply an individualist in a world not suited to individualism, why, on his own new world—

"Good-by, Carthage," he said suddenly.

"But didn't you have something to tell me?"

"Not just now." Wingate managed a grin. "You'll find out later, Carthage. Good-by."

He turned and hurried back to the street, hailed a surface car, and returned to the heaven-climbing pillar of a building where Hudspeth had left him locked in.

It took some time to find again the floor where Hudspeth's room was. Coming to it at last, Wingate tried the door that had been locked upon him; it was still locked. He sat down, with his back against it. Finally he slept.

The voice of Duke Hudspeth awakened him. The outlaw stood in a doorway across the corridor, grinning. Wingate, rubbing his eyes, realized clearly that Hudspeth's weight was largely in the chest and shoulders, and that his heavy face was not softly round, but square.

"Ye see, I didn't go far," Hudspeth told him. "I heard ye leave last night—didn't expect that, after ye gave yer promise."

Wingate dropped his own eyes, and a memory came to him of Carthage's words: *Hudspeth's bad luck and bad reputation come from trusting others too much.* Was it true, then, that his outlawry had begun because he had murdered to protect his native world's secrets, and had been made a scapegoat?

But Hudspeth was continuing. "I heard ye come back, and left ye unhailed—feared police spies following. Well, why did ye do it?"

"Never mind," pleaded Wingate. "I'm sorry."

"And ye're forgiven. Come."

"Come where?" asked Wingate.

"We start at noon for Ulysses."

Wingate got to his feet, astonished. "But Zero Hour's at noon tomorrow," he reminded.

"Yes—for the governments who made the rules. But, until we win Ulysses for ourselves, we're not a government—only outlaws. We start this very day."

III.

PULAMBAR is a pure pleasure city—not so its suburban communities. One of these, in particular, is a dingy meddles of foundries, machine shops and junk heaps. In its midst, on the day that Hudspeth led Wingate there, stood a rickety clump of sheds with, among them, a round metal-lined pit. In this metal-lined pit was set, like an egg in a cup, a battered-looking space hulk. The arrangement looked like an old-fashioned socket port, such as were used in the early days of space flying—which was exactly what it was.

As Hudspeth explained to Wingate, this primitive device was needed, for he must take off in secret. It would be impossible to use a regular skyport, with service crews and metal-plated fields against which to blast the powerful starting rockets.

"It doesn't look like a long-shot ship," observed Wingate, studying the craft.

"No more it was, to begin with," replied Hudspeth. "Just an old *Lincurgus* cruiser—ninety feet long, thirty-foot beam. But I put in extra engines and tanks, where the cabins and holds used to be aft, bent on new jet tubes, and bored vents for additional blasts. She'll go fast and far."

"I marvel how you kept her comfortable," said Wingate, as they approached the poised vessel.

"Who said she was comfortable? Get in."

Hudspeth opened a port, and they entered.

The control room, cluttered with control board, instrument panels and a whole forest of levers in slots in floor and wall, was some fifteen feet by twenty. Here stood four figures in

coveralls. One of them, the single Martian, moved forward a pace. His bladder-body had been clamped into a steel corset, with the lowest pair of his six tentacles surgically altered and strengthened to serve as legs.

Many Martians had been thus remodeled to a roughly Terrestrial figure, more suitable to active life than their own octopuslike anatomy.

The Martian's face, instead of features, bore only a tufted expanse of petallike tags of tissue. Just now they twitched nervously, and from among them came words, shaped by the artificial voice-box: "Captain Hudspeth . . . I am surprised. I did not expect—"

"Oh? And what did ye expect then, my friend Ind?"

Wingate had heard of Ind, most noteworthy of Martian space-engineers. Was this he? The Martian's next words answered him: "Captain, I was to make one of the crew of the Martian entry. You came and offered me an inducement . . . if I came with you—"

"I did," nodded Hudspeth. "I promised that, if ye flew with me and helped me win, ye should have more than money; a land interest on the planet Ulysses, and a nobleman's rank. And so ye shall, Ind, so ye shall."

The Martian was not mollified by so much as a pennyworth. "Captain," he pursued stiffly, "these others tell me that this is not the official Terrestrial entry—"

"Who said it was? I'm flying on my own. Did I say I represented Earth, Ind? Didn't ye make an unwarranted conclusion?"

"I surmised, since you are a Terrestrial—"

Hudspeth waved it away. "Independent entry, Ind. Representing the future free government of Ulysses. We're pointing for a free new world, which we'll rule ourselves. Eh, you others?"

THE three Terrestrials murmured agreement, real or simulated. The slimmest and youngest—Wingate noted that his long brown hair was artificially waved, and that his coveralls were specially tailored, as though he were vain of his elegant figure—spoke in a cultured murmur:

"Gentlemen, I have all faith in Captain Hudspeth, or I wouldn't have signed on as his second-in-command." He seemed to feel that his presence in the control chamber gave distinction to the enterprise; as he spoke, he leaned gracefully upon a walking stick made of metal, beautifully lacquered. It seemed a strange thing for a space-officer to carry on shipboard.

"Spoken like a true heart, Mr. von Ghul," applauded Hudspeth. "What do ye say, Hiffin?"

"I say that, when you bailed me out, sir, and me in clink for smuggling Jovian liquor, I promised to do whatever you asked in return," said the wiry, merry-eyed fellow addressed.

"And ye?" Hudspeth turned to the remaining man, a simple-faced youngster who was bigger even than he. A giggle was the return, apparently signifying loyalty.

"I demand to be released," began Ind, the Martian.

Hudspeth, who had crossed to the table that supported the controls and was resting one hand upon it, lifted the other to bring silence. He began to speak:

"As I was telling our new recruit, Wingate, just now, we have more action than comfort aboard this ship. No television. No radio. No clothes but work clothes. All the food is compro-synthetic. The water will be rationed. There are only three cabins, with only one bunk in each—one watch will sleep while the other stands. All the extra space is taken up with additional engines, fuel storage, controls. Ten months of hard labor between here and



"What are you doing here?" demanded von Ghul.

Ulysses; all the fun comes afterward.

"We'll choose watches. I'll take Hiffin for engineer."

"Iad for my engineer," chimed in von Ghul.

"Wingate for yannigan," rejoined Hudspeth. "That leaves Milliford to yannigan for you, Mr. von Ghul."

The big fellow called Milliford giggled again, and Iad burst out angrily:

"I refuse to serve. Let me out of here!"

"If ye insist," sighed Hudspeth. "But it's ever so far down. Peek out that port."

They all turned to look through the glassite. Mars was dropping miles away beneath them, a vast red terrain that bulged like a reversed saucer, streaked with canals and centered like a target, with the blotch that was Pularhar.

"How's that for a gentle take-off?" Hudspeth demanded triumphantly. And for the first time they realized that, while he talked, his hand had rested on the starting switch.

"I touched her out of the socket as I made my speech," he continued. "Thought we'd make a leisurely ascent and clear the atmosphere just at noon. None of ye noticed—maybe my eloquence had ye spellbound. Anyway, we're far up, and without parachute or life-shell. Iad, ye don't seem to be leaving, after all. I take it ye've changed yer mind. Report to Mr. von Ghul's watch."

With a flick of his slender metal cane, von Ghul gestured his two subordinates from the control chamber. Hudspeth turned to the keyboard of the controls, and began carefully to increase speed.

IV.

AN ANCIENT player of baseball first pointed out that interstellar flight was a problem, not for a gunner, but for a batsman. A spaceship took off

for a distant planet, but that planet was not stationary like a target; it moved, and swiftly, like a ball from the hand of a macrocosmic pitcher. Not only did the hurtling flight of the ship, that gulped miles in a second, demand exact foreplanning; the journey of the planetary objective, sailing in its orbit, must also be considered, computed, and the two paths brought to the proper intersection in time and space. Undoubtedly this pioneer comparison helped to bring baseball slang into the science of space navigation. Thus, "strike-out" meant a fatal miss of destination; "home run," a long trip from inner to outer planets; "yannigan," an apprentice or minor spaceman, and so on.

The problem of synchronizing speed-directions for ship and planet was difficult in the extreme, where the long flight to Ulysses was concerned. Yet Hudspeth had apparently solved it, with no help from specialists or government bureaus. It was noon exactly as his ship cleared the atmosphere of Mars. He finished the most intricate of his series of combinations on the control keyboard, and straightened up.

"We're set on the groove," he announced. "No hard work now; Wingate, check this table of logarithms against the other, see if they balance all right with the chart. Hiffin, are you satisfied with the engines?"

"They're darlings, sir," replied Hiffin, and smiled as though he hoped the answer was what Hudspeth wanted. But the outlaw captain studied a series of gauges, scowled, and himself made changes.

"Watch the mixture," he cautioned. "I want no pitted tubes or sloppy combustion. Get Wingate here when he's through with the checking, and show him what to look out for."

Wingate, as yannigan for the watch, was under orders of both navigator and engineer. His first twelve hours of duty were crowded ones, and he was tired

and somewhat confused when von Ghul's watch took over and released him.

Then he went to explore the rest of the ship's habitable part. There was not much to see. The control chamber was oblong, save for the curve in the outer bulkhead. Opposite this curve, at the inner partition, a panelway opened into a narrow, metal-lined corridor. Three cabins lined the side of this corridor, all doorways at the right hand as one entered from the control chamber. The nearest to the entry would be the yannigans' cabin, occupied alternately by Wingate and Milliford. The middle cabin belonged to the engineers, Iad and Hiffin. The farthest was for the commanders. Beyond, at the remote end of the corridor, was a fourth panel, closed and locked. All other space—the baggage holds, lounge, promenade—had been filled with the extra machinery needed to transform a cruiser into a long-shot, high-speed vessel.

Wingate inspected his own cabin. It had one bunk, two small lockers, an outer port of clouded glassite that showed a velvet-black sky full of stars. Then he lighted a cigarette and headed for the end door.

"Douse the smoke," said a voice behind him. It was Hudspeth, who came lounging away from his tour of duty. "We've got skimpy air-fresheners, Iad—sacrificed for better flight power—and tobacco is out. Ye'll learn not to miss it."

Wingate, a little miffed, dropped and trod on the cigarette.

"Pick it up and put it through the incinerator port by the control chamber door," ordered Hudspeth. "Shabby we may be, but ye'll be clean."

Again Wingate obeyed. Then, walking along the corridor, he put out a hand to try the end door.

"Ye'll find it locked," Hudspeth told him. "It's the commissary—only officers allowed." Then he laughed. "But I musn't curb ye every minute.

Iad. Come to my cabin, and have a yarn."

WINGATE followed him into the cabin next the commissary. It was slightly larger than the other two. Hudspeth offered him the single chair and sat on the bunk.

"I take an interest in ye," he continued. "What's the saying? Save a man's life and ye owe him something. I'll make yer fortune."

"I had one fortune," said Wingate, a bit ruefully.

"I'll make ye a greater, then. Ye start this voyage a yannigan—ye'll come back a prince of a new world."

"But if we don't win the race?" suggested Wingate; and added a respectful "sir."

Hudspeth did not appear shocked by the possibility. "We don't plan to lose, Iad. Meanwhile, the captain must teach the yannigan."

He talked for upward of an hour, about matters that Wingate had hitherto vaguely taken for granted, because he he had only ridden, never flown, spacecraft—fuel mixtures, gravity gauges, computations of position, run and speed. Wingate found himself understanding a little, and even enjoying the lecture. Hudspeth progressed to remarks upon the particular flight they had begun. When Wingate asked how Hudspeth's plan for a new government could possibly succeed, the outlaw captain grinned as though it had succeeded already.

"Ye know, Iad, how a tiny touch can balance great weights, or disturb a balance already effected? Well, that's us. Stop and consider:

"This rush to Ulysses is done under rules that amount to a treaty, all taking off with even chances. The planets have agreed because there can be no doubts, no challenges, about the winner. Each world has too much need to win for a challengeable situation to be allowed.

"But after the race is done—

think! It'll change the history of the Universe! For generations we've had a Martio-Terrestrial League to keep order in the System and in particular to frighten Venus; and the Jovian moons have made good their secession from the inner planets that colonized them. Such a set-up would have lasted forever, with all habitable worlds spoken for and their status clarified. But now comes Ulysses, to take an orbit right in the middle—splitting Earth and Venus away from Mars and Jupiter.

"All right, suppose Earth gets him—she can dissolve her treaty with Mars, to whom she sends food and fuel in return for a guarantee of aid against a possible Venusian attack. Or Mars wins—the Martians won't need the alliance, for with a new planet they can raise sufficient crops, colonize new lands, mine new metals, be strong enough to fend off trouble."

Wingate shook his head. "I always thought that the Martio-Terrestrial League was here to stay."

"It was formed through necessity, and that's the reason it goes on. But do Martians like Terrestrials, or vice versa? Not enough, lad. However, suppose neither Mars nor Earth gets Ulysses. Suppose the Jovian ship wins. Jupiter will have a world between Mars and Earth, with resources and position to make for a great power in the System. And if Venus gets the prize, she can build up strength and do what she's always dreamed of doing: whip and plunder every other planet that has anything worth taking."

"It sounds horrifying, captain," Wingate almost moaned. "War and trouble ahead."

Again Hudspeth spoke cheerfully: "But we're in it, too—in the race, I mean. If we get there first, declare a government, they can't say us nay. No planet can let another step in, because whoever looks us out will take over—so each planet will protect us from the

others. We'll be the spoke in the wheel, disappointing all the governments, and keeping them peaceful."

It sounds almost high-minded, but too pat. Wingate could not help saying: "You can't make me believe that you're in this for your health and the System's benefit, sir."

"Did I say that I was? But yannigans mustn't admonish their superiors—the buck's passed down, and not up. Sweep these cabins and the corridor, and put the trash through the incinerator port, as I showed ye. After that, come back here with Hiffin and draw yer rations."

WINGATE'S first meal in space—he was not very hungry, even after twelve hours of ~~work~~—was a pemmicanlike concentrate of beef and vegetables, with starchy dumplings for bulk and energy. The only drink was water, and not too much of that. Afterward, he slept, and when he rose to take his duties again, the ship had been gone from Mars for twenty-four hours. Although there was neither radio to hear nor vision screen to see, the travelers knew that the four government entries were now touching off from their various worlds for the flight to Ulysses. Zero Hour—and Hudspeth had beaten it by half a day. Would he hold the lead? How?

It was understood that the two watches would keep out of each other's way—the watch on in the control chamber, the watch off in the cabins and corridor. Only Hudspeth, who slept very little, sometimes wandered in while von Ghul was in charge, talking to his second-in-command, or to Ltd. or Milliford.

Days passed, full alternately of toil and calm. They approached the Sun, and cut closely around it in an "out-shoot" curve, sacrificing long hours of temperature comfort to win a little extra time. Hudspeth, whose watch was on during the adventure, wondered

aloud if the Martian entry would have the nerve to swing so narrowly close. He hoped not.

"We need every advantage," he kept saying. "Since we have no way of observing where our rivals fly, we have to keep our best speed at all times. As a matter of fact, all five craft may finish within hours of each other. We're gambling on a margin as narrow as a piano wire."

Wingate learned much about the less exacting work of space flight. Hiffin, the engineer, called him a good yannigan, and Hudspeth began to trust his calculations of speed and direction. Despite the small volume of concentrated food issued daily, his enfeebled body grew broader and healthier, and he learned not to crave the forbidden cigarettes.

Beyond the Sun, a new course was laid for Ulysses, a course which took them almost within touching distance of the Jovian System, then on and on, without so much as a dust speck to attract them in space. Hudspeth finished the delicate adjustment of the control keys.

"I'm proud of these last calculations," he announced to Wingate, who was helping him with tables of figures. "Ye see, in computing the time, and also the position of Ulysses at the end of that time, I did what no other skipper is doing—laying my course a whole day early. We left ahead of the others, ye remember. And it takes a mathematical head. Now, before we finish checking, go to Mr. von Ghul, and ask him to give ye the slide rule that lies on the table in the officers' cabin."

Wingate went obediently through the door into the corridor. The door of the cabin shared by Ird and Hiffin was closed tightly, while the other two—the officers' and yannigan's quarters—stood open and empty. Wingate went to the door that led to the commissary, half doubled his fist to knock, but thought better of it. Hudspeth had impressed

upon him the sanctity of that compartment. He would wait for von Ghul to come out. He fell idly back along the corridor, opposite the closed door to the engineers' cabin.

His thoughts were on Carthage Dawes. What would she think if she knew he was one of this ship's party—learning a space-hand's job under Duke Hudspeth?

"I can't say how glad I am that you've taken this step."

It was her voice. Here, on the ship, almost at his elbow. Wingate felt his mouth grow dry, and a pulse leap up in it. Had his thoughts been so deeply of her that he had actually imagined hearing—

But there, Carthage was speaking again.

"Go on, in the way you've begun. Carry out the work and you can ask me for anything in all the Universe."

Her voice came from behind the closed door.

V.

FOR A MOMENT Wingate stood still and stared, wondering if he were mad or dreaming. At the end of that moment, the door flew open without warning. Wingate actually thought to see the oval face and direct green eyes of Carthage Dawes.

But it was the face of von Ghul that appeared. The second-in-command glared, and his knuckles whitened as he gripped hard the metal cane he always carried.

"What are you prowling here for?" challenged von Ghul, lifting the cane. Wingate expected to be struck. From the cabin glided two other forms—chrysanthemum-headed Ird to Wingate's left elbow, and huge, simple M-lford to his right. The three hemmed him against the wall.

"I . . . I was looking for you—" Wingate replied, trying to fight the stammer from his voice.

"Yes?" snapped von Ghul. "Why aren't you in the control chamber, at work?"

"Captain Hudspeth sent me . . . for a slide rule."

A grin replaced the glare. Von Ghul was trying to achieve calm, too. "Oh?" he said. "Why didn't you say so instead of startling us? Come to my cabin." Von Ghul searched out the rule and handed it over. His gaze was less hostile, but still suspicious.

As Wingate returned to Hudspeth, he snatched a quick glance into the cabin whence Carthage's voice had seemed to come. Iml sat within, on the bunk, and Milliford lingered at the door. There was no one else. Mystification and panic fought for mastery of Wingate's mind. When he gained the control room again, his hand trembled so that he almost dropped the slide rule.

"Have ye seen a ghost, lad?" inquired big Duke Hudspeth. "Ye've taken a long time at yer errand. Copy these figures as I read them off."

Twice, in his agitation, Wingate was forced to ask for repetitions. Hudspeth paused in reading to study the yamgan. "What's up?" he demanded harshly. "Ye've gone stupid. The reason, lad—out with it!"

Wingate dared not glance toward the door to the cabins; yet something told him that von Ghul watched and listened there, his hands crossed upon the knob of the metal cane. "Not so loud, sir," he begged in a whisper.

"Come on, speak!" insisted Hudspeth. "If you'll only wait, sir, until we're off watch; it's something of importance, and strange—"

Hudspeth seemed suddenly to understand and accept. "Very well, then," he agreed softly. "We'll drop it until later. Now, pay better attention to my readings."

And that was all that was said on the subject until the watches changed. Wingate turned over his routine work

to Milliford, who was silent but prone to eye him sidelong. As Hiffin, turning over the engines to Iml, approached the corridor door, von Ghul stopped him and spoke to him softly but emphatically. Both their glances turned briefly upon Wingate, who felt more nervous still.

Hudspeth, brushing against Wingate, muttered: "My cabin—fifteen minutes."

DURING those fifteen minutes of waiting, Wingate heard von Ghul's watch settling to their work without further suspicious activity. Finally he went to Hudspeth's cabin; Hiffin gazed suspiciously from his own quarters as the young man passed. Hudspeth looked up, waved his visitor to a seat on the bunk, and himself occupied the chair next the doorway, so that his eye could command the corridor.

"Since ye spoke of strangeness, I noticed it in the atmosphere," he said, not too softly to make Hiffin realize that they were being secret. "What's going on, lad? Quick."

Wingate told him. Hudspeth listened without word or change of expression. When the story was finished, the captain scowled.

"Those three are all in it, and Hiffin, too—the rig must be where he knows about it, so they wouldn't leave him out—"

"What rig, sir?"

"Ye heard the woman's voice. Ye recognized it. She's the skipper of Earth's entry. What was it she said, once more?"

"I haven't forgotten that." And Wingate quoted: "I can't say how glad I am that you've taken this step. Go on, in the way you've begun. Carry out the work and you can ask me for anything in all the Universe!"

"In other words, she was bribing them," nodded Hudspeth. "They're in her pay—all but yer-self, lad. Four to two against us; but, if ye stand by me—"

"I will, sir," assured Wingate. Suddenly he felt deep loyalty to the big outlaw, and dependence upon him. "But how did I hear her voice?"

"How but by radio, probably a television. I fitted the ship without one, but von Ghul, whom I trusted, must have put it in—it wouldn't be difficult. With Hiffin and Iad both won over, he planted the set in their quarters. And when she gives the word—"

It was coming clear in Wingate's mind. Carthage had known, somehow, that Hudspeth would be a rival skipper in the race, though probably she did not guess that he flew for his own fortune. And she had freely admitted that she feared him more than any other opponent. Von Ghul had known this—must have conspired with her, before the take-off, to betray his captain. "When she gives the word?" he prompted. "What then?"

"For mutiny. Our finish," was the ready reply. "We'll be defeated, probably arrested. Execution for me; the stars know how many killing charges are against me in every government book. You'll get off alive. The others, for selling us out, will be pardoned and rewarded."

"We'll stop them," said Wingate, with more steadiness than he had expected his voice to manage. Hudspeth grinned.

"So we will. Listen! Tell Hiffin to step in here. I'll keep him for twenty minutes. Find that set in his cabin, that television. Learn what ye can about it. And we'll go on from there."

Leaving, Wingate passed the word to Hiffin. As the wary engineer went into Hudspeth's cabin, Wingate slipped into the cubicle Hiffin had left.

Every nerve tanned in the youth's body. He had a sense of awkwardness, of danger. What if Hiffin returned and caught him? But Hudspeth had promised twenty minutes' freedom. Well, what about von Ghul leaving the control chamber on an errand? Or Iad, or Mil-

lifford? Wingate banished the thoughts, bent and looked under the bunk. Nothing.

There were few hidden corners, and he investigated them all. Then he tried the doors of the two lockers. Both were fastened, but the keyholes bespoke simple locks. From his pocket, Wingate drew his claspknife, one blade of which was a long, tough needlelike probe. With it he dug into one keyhole, found a yielding mechanism, and forced the door open. The interior held odds and ends of Martian personal property—it must be Iad's locker. Closing it, he forced his way into the other. At its back, half concealed by a jumble of clothing, was a rectangle of smoky glassite. Unmistakably, it was a television screen.

PULLING away Hiffin's clothes, Wingate found two dials at opposite corners of the glassite rectangle. They were tuned, apparently to a certain wave length—to that of Carthage Dawes' set. But Wingate knew he must be sure. He pressed the power button.

The vision screen lighted at once. He saw the interior of a metal-lined cabin, and the head and shoulders of a human being—Carthage Dawes—as though he faced her at a desk where she worked. After a moment, her green eyes looked up.

"Yes," she said, "what is it?" Then her imaged eyes widened. "Why it's Burr Wingate! Then they didn't deceive me, after all!"

She sounded pleased. Wingate mumbled: "Yes, Carthage. I'm on Hudspeth's ship."

"So von Ghul said, but I thought it was some farfetched joke. Well, since you're tuning in on me, I suppose you've joined the others in my scheme?"

"Yes," said Wingate again. "I've joined." He had once been a naive facile liar than he felt himself now.

The girl was smiling by now. "And

you'll help all you can? Sabotage Hudspeth's unauthorized, trouble-making entry? Burr, I begin to have hopes you'll amount to something. And you've joined just in time, haven't you?"

"Just in time?" he echoed stupidly.

"Of course. Don't you know that when von Ghul comes off watch, he's going to . . . hold on! Are you really in this plot, Burr, or—"

Nervously, he clicked off the power, slammed the door of the locker, and left the cabin. He heard Hudspeth and Hiffin chatting, apparently about old smuggling days in which they had been associated. Walking to the door, Wingate saluted.

"Captain Hudspeth," he said formally, "I wish to report that the . . . the matter you asked me to look into is exactly as you surmised, sir."

"It is?" rejoined Hudspeth, with the utmost of good-humored calm. "Thank ye, lad. Ye're turning into a good yan-nigan. Isn't he, Hiffin?"

Hiffin nodded and smiled. "A fine one, sir. What was the job he just did so well?"

"A routine mechanical check-up," Hudspeth lied readily. "If his figures agreed with mine, I told him, he'd be working correctly. Anything else, Wingate?"

Wingate hesitated a moment, wondering how to pass on more information. "I'll put it this way, sir. When the next watch changes, those calculations we talked of are due to come to a climax—"

"What's this?" spluttered Hiffin, suddenly and sharply. "What about the next watch changing? What are you two driving at?"

"Nothing of any consequence," Hudspeth assured him gently. "Keep yer seat, my friend. Keep it, I say!"

Hiffin had started to get up, when Hudspeth, cat-quick for all his size, sprang forward and thrust him back into the chair. As the engineer's mouth flew

open to shout, Hudspeth's hard hand clamped over it.

"Strike him on the head, lad," Hudspeth quickly ordered Wingate. "No, not with yer hand—with that wrench on my cot. Hard, now! Well done! I couldn't have bettered it myself. Now, we'll lock him in here, and go plot-nipping."

VI.

ONCE OUTSIDE the cabin, Hudspeth snapped the automatic lock shut. He faced Wingate. His eyes danced in his heavy, alert face, as though he were greatly entertained.

"We've no arms, lad. They, planning trouble, must have fighting gear of some sort. Even with Hiffin out of it, they're three to our two. But ye'll pull yer weight, and I . . . I'm Duke Hudspeth."

He said it with conscious pride, as he unlocked the door at the end of the corridor, where food supplies were kept. Beckoning Wingate to the threshold, he pointed to a great stack of tins, parcels and flasks.

"That's a full half of our rations. Carry it to the incinerator panel beside yer own cabin and fling it through."

"Destroy our food?" gasped Wingate, uncomprehending. "Why?"

"Do as yer told. I give ye ten minutes. Then come to the control chamber. I'll be talking to von Ghul—call to him that Hiffin wants him. Get his attention away from the control board."

"Yes, sir." Wingate felt his confidence return, full and strong. If the outlaw captain's tactics were too deep for his understanding, they would be too deep for von Ghul's, as well. Hudspeth turned and strode away to the control chamber, and Wingate began to load his arms with the containers.

He did the job in ten minutes—a ton of foodstuffs, transported a hundred-weight at a time and flung into the chute

that led to the destroying fires of the rocket blasts. At the end, he was winded and weary, but he must hasten and carry out the rest of Hudspeth's orders. He went to the control chamber door, and looked through. Hudspeth talked to von Ghul at the controls, and beside the fuel-gauge board Iad and Milliford noted down figures and carefully turned dials.

Wingate steadied his voice and raised it:

"Mr. von Ghul! Hiffin's in his cabin; he asks if you can come."

"What?" The second-in-command turned from the control keys. His eyes and hands were away from his work. "If Hiffin wants me, he can come here, but issue orders to his superior officer—"

Hudspeth sprang. A thrust of his huge shoulder sent von Ghul staggering away. The captain's hands fell upon the row of keys like a frenzied organist's. He struck a great combination of powers, so that the ship trembled and hummed in flight. A second later, he had caught up a loose lever handle and was battering at the keys.

"You fool!" squealed Iad, turning from his gauges, every petal on his head standing erect. "What is it? Are you wrecking the ship?"

"No," panted Hudspeth. He fitted the lever to its socket, shoved it down, and wedged it into immovability with a shoving kick of his back heel. He turned triumphantly to face the others.

"Not wrecking the ship—only keeping ye from wrecking it! Yer mutiny's gone to seed. I've jammed the ship on her course; it'll take weeks to mend the controls. And then it'll be too late."

"Never think it," snarled von Ghul. His metal cane whizzed in the air. Hudspeth snatched at the end of it, and a moment later it seemed to come away in his hand—but it was only the shank of the cane, like a loose sheath. Hold-



ing to the handle, von Ghul cleared a concealed steel blade from inside.

"Sword cane!" yelled Wingate warningly.

"Get that yannigan!" von Ghul ordered Iad and Milliford, who rushed on Wingate. At the same time, von Ghul attacked the captain with his bared blade.

BUT Hudspeth, swifter than the slim von Ghul for all his brawny bulk, had parried two thrusts with the cane shank he still held, and sped a return blow. By skill or chance, that riposte landed



full on the eye of the sword wielder, bringing a spurting gush of blood. Von Ghul swore, staggered, and sprang backward. Hudspeth, ducking under the wavering point, closed with him.

This much, happening in half a moment, Wingate saw even as Lad's throttling tentacles whipped around him and Milliford's big, clumsy fists began to hammer his face. Wingate fought back, not very effectively, then went down, blows showered upon him, but suddenly ceased.

The weight of his enemies rose from him. Hudspeth was driving Lad and

"There won't be any turning back now," Hudspeth roared. "Ye won't fix those controls this day!"

Milliford back, at the point of the cane blade he had wrested from von Ghul.

"Back!" he growled. "Back, or I'll lance the two of ye, and let a few gallons of cleverness out! That's better. Go and wash von Ghul's face. He's had enough, too."

Sure enough, the leader of the mutiny sprawled and moaned beside the jammed control mechanism. The eye which had

escaped the rapping slash of the cane¹ shank had been blackened almost to the chin, and the mouth had been cut and smashed by a powerful blow. Crestfallen, Millford and Iad went and stooped above him, while Hudspeth hurried to the fuel gauge. He twisted a dial quickly, studied the result on the instrument panel, and laughed aloud.

"See!" he cried. "There goes our return load of fuel!"

"We'll be lost," gurgled Iad, even his artificial voice growing hysterical. The mutineers looked as though they were rallying for another attack.

"Stand easy," Hudspeth warned them merrily. "The fighting's over. We'll ride lighter and go faster. But no mutiny can help. Is that an electro-automatic pistol ye're fumbling for, Millford? Hain't time to draw it up to now, did ye? Well, hand it over to Wingate. Iad can do the same with that gun that makes a lump under his cover-all.

"For there's only fuel enough to get us to Ulysses. Yes, and only food enough. I put in return supplies—but I've dumped them. And the controls, as I fixed them, can't be repaired so that speed can be checked or direction changed until it's too late to turn back."

Von Ghul sat up and stared. His bruised face was stamped with horror and embarrassment. The two others meekly surrendered their weapons.

"Do you realize, captain," said von Ghul shakily, "that it'll be almost impossible to survive if we don't reach Ulysses."

"It'll be entirely impossible to survive if we don't reach Ulysses—and first." Moving to Wingate's side, Hudspeth took one of the electro-automatics. "Attention, all hands. I'm going to tell ye a story—the first time I've ever told it, and I hope the last.

"Once I was a captain of the World League's police. A Martian spy came

to steal a government secret—which still remains a secret, so far as I'm concerned—and I killed him. Did it with a single grip and twist—as I might do to Iad yonder. Saved the secret. But Mars began to inquire. If the truth were told, there might be interplanetary trouble, and the treaty in danger; so, to keep things friendly, Earth let 'em have a scapegoat. Me."

Hudspeth's face grew dark, drawn. "I started to Mars on a prison cruiser. Midway of the run, I took that cruiser from my guards—as you tried to take this ship from me. I went back home. But Earth, fearing because I knew that secret I'd killed for, and misjudging that I might tell it, trumped up a charge against me.

"I flew to Ganymede. A Jovian operative tried to betray me for the reward. He'll never betray anything again. I went to Venus. They tried to make me a spy against Earth—condemned me to death when I refused, but I cut my way out of their prison with a makeshift ray-thrower. Since then, I've been smuggler, thief, pirate. All the police forces of all the planets are hunting me. And—here I am.

"That's the truth. I tell it, not to make ye mourn for me, but to show I won't be taken or balked—not even slowed up. Ulysses is going to be my own world, where I can rule, live, be safe from everything. Ye've tried to break faith with me—but ye'll all keep faith now. I dare any of ye to mutiny again!"

He drew a long breath, and glared. "Am I clear? Do ye know a larking when ye've had it?"

It was plain that they did.

"Then back to yer posts! As ye were—and carry on!"

HUDSPETH and Wingate turned toward the cabins. "What will you do with them, sir?" asked Wingate softly.

The captain actually chuckled. "What Lincoln wanted to do with some other

rebels, more than a thousand years ago. Remember his words? 'I'll deal with them as if they had never been away.' I need them on the rest of the voyage, and they've learned their lesson."

"But they're faithless—they tried to sell you—"

"And so did ye, once. But ye stuck by me this second time. Let's go to that hidden televiso ye dug up."

They went, and none stayed them—considering that the controls were jammed almost irrevocably in place, von Ghul's watch seemed to be finding much work to do. In the engineers' cabin, Wingate forced once again the lock and revealed the vision screen. A touch of the button, and Carthage's face appeared to them.

"What's happened?" her impatient demand came to their ears. "I've been signaling and signaling—Burr! You again?"

Wingate bowed to her reflection, as though he was in a drawing room with her. "Me again," he said. "Allow me, Miss Dawes, to present Captain Duke Hudspeth."

"A pleasure," chimed in Hudspeth, with a courtly bow of his own. "I'm sorry, ma'am, to report that yer mutiny plot is off the mound. I've stopped it, struck it out—and there'll never be another."

Carthage's green eyes frowned. "It . . . is it possible? But . . . Captain Hudspeth . . . perhaps you and I can agree—"

"If ye mean to suggest that I can be bought off," interrupted Hudspeth gently, "the answer is 'no.'"

Carthage was looking again at Wingate. "Burr," she appealed, "you once said you'd do anything for me. This flight—and victory—means so much to Earth. If you could persuade your captain to stop this unauthorized venture that may bring interplanetary war—"

"Carthage," said Wingate, "I can't be tempted or tricked. Good-by. When

you reach Ulysses, we'll be waiting to welcome you."

He shut off the power. When he turned to Hudspeth, the outlaw captain was holding out a big hand.

"Congratulations, lad!" he cried. "And I'll call ye lad no more, for ye're a man. Ye uncovered the plot, ye stood by me to fight and win against odds, and just now ye refused to be bought or blandished by the girl ye love. Of such stuff are proper men made. I'm proud to call ye friend—and my second-in-command!"

"Second-in-command?" echoed Wingate.

"Right. I've spared von Ghul, but I won't ever trust him. Ye've learned enough and to spare about space-flying. So ye go to head of the watch—Hiffin drops to yer place as yannigan—I take von Ghul for my engineer. Go and relieve him, while I let Hiffin out and let him know what's gone on since he dosed off."

VII.

MONTHS of time, millions of miles, had gone by. The Sun lay far on the back trail, a small and bitter-bright point in space. No worlds showed themselves against the distant velvet depths of heaven. But up ahead loomed, a great round blob of gray-green—Ulysses—the goal toward which five racing ships strained every atom.

Farthest back was the Martian entry; something was wrong with the tube metals, and they had become pitted, erratic. Well ahead of Mars, in fourth place, soared the ship of the Jovian League, the hardy crew trying to make up in spacemanship what it lacked in equipment. Next, almost side by side, and not more than two miles apart, strove the lean silver cigars of Earth and Venus. And ahead of all went that strange outlaw vessel, flown by apostates and renegades and commanded

by a man wanted for crimes on every planet—Duke Hudspeth.

But Hudspeth did not hold his lead. He slipped back, and back. Venus and Earth, full of inspired hope, coursed after him, up to him, past him. He fell whole seconds behind, then held his third place, as if content with it.

Why?

The Jovians wondered, the Terrestrials wondered, the Venusians wondered, the outclassed Martians wondered; and, in the control chamber of the slowing ship, Hudspeth's young lieutenant, Burr Wingate, wondered. He said so.

"If I didn't trust you, sir," he told Hudspeth, "I'd think you had lost your wits, or your nerve."

Hudspeth was managing the repaired controls with agile, knowing fingers on the keys. "We'll win," he promised. "We can't help but win—after slacking off like that."

"But how—"

"I'll put it in two short, well-chosen words: 'Ware Venus!'" said Hudspeth. "Ye still don't understand? Do ye know Venusians?" The captain's heavy face seemed to reflect grim old memories. "They're a bad lot, Mr. Wingate. As bad as the Universe affords. Have on yer old clothes when ye cross a Venusian—because it means trouble. And that Venusian ship yonder will stop at nothing to win."

"You're sure enough of that to relinquish your lead?" asked Wingate.

"Look, and ye'll make out weapon ports on her," was the reply. "Why is a racer armed for space-fighting? Answer me that."

Wingate studied the televiso—it had been brought from Hiffin's locker into the control room. He nodded.

"I see what you mean. But, if we fall back now, what about the finish? It's nearly at hand. Won't Venus keep the lead over us—and won't Earth hold the same lead?"

"Neither will hold a lead. For Earth is the big threat now. Those Venusians will ray out the Terrestrial entry. That will take moments, though. And we'll whip by, get a safe lead, slide home—"

Wingate suddenly was not listening. Even as he stared into the vision screen, he saw that Carthage Dawes and her ship were in dire danger.

The televiso viewpoint rode above and abreast of the two leading craft. The Venusian entry was at the left of Carthage's ship; and at the right side of it little black rings—two, three, four—became visible. Ports were opening.

"Ware Venus!" cried Hudspeth. "Watch for MS-rays!"

He cut his own speed a trifle more, with definite determination to remain clear of any violence. As he spoke, lean streaks of silvery flame gushed from the ports of the Venusian ship, reaching for the rival like vicious tentacles—and falling short.

For Carthage had suddenly fired her upper nose-rockets, sliding down even as she went forward. The rays flashed over her, finding no immediate target. "Strike one," breathed Hudspeth, craning his muscular neck to see.

"She's doomed," Wingate said nervously. "She's unarmed—"

"No, she isn't," Hudspeth cut in. "Watch."

As the Terrestrial ship fell away below the Venusian, it seemed to spout forth bright little bubbles, that sailed upward as if with life and knowledge of their own.

"Roving bombs," said Hudspeth.

Apparently Carthage had come prepared for trouble, too. One of the bombs, radio-driven and guided, flew full at the rear group of Venusian rocket tubes, and the attacking craft had to dance in space to avoid its blast. Another bomb exploded in front of the attacker's nose, with a brisk force that

must have made the forward ports creak in their stout frames.

"Well done," applauded Hudspeth. "Wingate, yer lady friend isn't going to go down without a fight."

"We've got to save her," Wingate said desperately.

"Yes? How? We've no weapons, not even one ray-thrower."

"We must."

HUDSPETH shook his head, eyes grave. "I know. Ye love her, though she insulted ye and endangered ye. But—"

"We might blast that Venusian with our rockets," broke in Wingate. "Look, those rays are going to catch her!"

Carthage's ship jumped and lurched like a salmon in a freshet, but not quite soon enough. The Venusian's rust-ray flicked across the flank of the Terrestrial ship, and a long red-brown wale showed there. Carthage tried to run, the Venusian closely pursuing. The next slash of the ray would seek to cross that first wound. At the junction of the lines the hull, doubly assailed, would burn through. Air would escape—gravity-balance would depart. A third stab of fire would finish the ship, and Carthage, and all.

"I hate to see it," Hudspeth muttered. "Even though she tried to do us in, I hate to see it."

"Give me the controls," begged Wingate.

"Ye saved this craft once. Do ye want to destroy her now? But take over!" Hudspeth had been watching Wingate, and seemed to change his mind. "I trust ye."

Wingate did not pause to thank him, but fairly hurled himself into the control position. His eyes were riveted upon the vision screen. His hands, made skillful by long hours of steering under Hudspeth's guidance, struck the "full speed ahead" combination. The ship put forth every ounce of forward

power, swooped upon the struggling pair ahead.

The Venusian's rays prodded for the enemy, found a target, traced a blazing streak at right angles to the first one. It crippled Carthage. She still fled, but clumsily. Within seconds, the third and fatal flick of the ray would overtake her. The Venusians must have been fiercely exultant, already counting victory theirs. They could hardly have known what rushed upon them from behind.

Wingate drove after the Venusian—over its back—beyond. A touch of controls, and he fell a little in his bullet-swift course, so that he flew directly in front of Carthage's foe. When the ship was aware of him, it might have tried to get away; but it was too late.

For, without ruttin his rear blasts, Wingate fired every rocket at his bow. The ship vibrated, her last atom of metal sang and shrieked, as though the plates would buckle, but the stout, old over-braced freighter hull took it, gushing fire fore and aft.

The Venusian ship was suddenly in the heart of the great flaming blossom that was Wingate's full rocket-gush to the rear. Not even plate of proof, trebled and insulated and braced, could stand that direct impact of pure heat. There was a deeper, redder glow, and a sideward bounce, like a football badly kicked.

The destroyer was paralyzed, gutted. Port panes were driven in, plates were sprung. After one moment of agony, the crew which had thought to visit death on others was itself ashes. The Terrestrial ship, that had seemed doomed, was slipping ahead toward Ulysses.

But the Terrestrial was not first among those that remained. Far ahead of it went the entry of Duke Hudspeth, already cutting blasts to enter the atmospheric envelope of the new world that awaited a ruler.

VIII.

IT WAS not too pleasant a landscape on which Hudspeth was setting down his ship. The soil was brown and bare, sloping away to a sea of ice on one hand, and lifting on the other to a horizon of sharp mountains. The sky was blue almost to blackness, and the far-away Sun gave somewhat more light than Earth gets from her Moon at its fullest. There was no motion or color of life. But Hudspeth smiled with relish as he listened to Wingate's report of the air tests.

"Nitrogen, oxygen, water vapor," reported the second-in-command. "Yes, and carbon dioxide, though there isn't any vegetation in sight."

"There was vegetation once," said the captain confidently, "and there'll be vegetation again. Trees, wheatfields, garden patches." He was silent for a long minute, as he set the ship down. "Break out the furs and woollens, gentlemen. It'll be a cold first day, but as we come toward Old Sol we'll be warmer, warmer—take sun baths, swim in the melted ocean—live like the kings we are."

He was first out of the opened sally-port. His boots made flat clapping noises against the frozen soil. He raised his voice in formal pronouncement:

"I, Duke Hudspeth, heretofore take executive possession of this planet, Ulysses, as my own personal domain and that of my heirs to follow, free of all governments and rules beside by own!" Then he turned to the others. "Out ye get. A poor thing, but our own, this world—and it'll be a rich thing in good days to come. Von Ghel, take Milford and slide up to those mountains. That scuttled Venusian ship will come drifting in. We'll mark its landfall, and salvage whatever we can, for we are short on food and other things."

Wingate was the last to emerge. He had checked all instruments. "Atmos-

pheric pressure's light, but the extra oxygen makes it healthful," he commented. "As we come toward the Sun, that light envelope will let through the heat we need, as much as Earth gets, once we slide past Jupiter, and our orbit's broken. Look, there comes Carthage Dawes!"

The Terrestrial ship was dropping down in slow spins, like an autumn leaf, carefully seeking a landing near Hudspeth. The three who remained near their own craft waited, curiously and somewhat tensely, until the other ship was down and opening its port. A slender figure, muffled in cloak and hood of thick fur, quickly emerged.

"It's Carthage," muttered Wingate, and Hudspeth stepped forward.

"Welcome, Captain Dawes," he called out. "Ye have my leave to land."

Carthage walked toward them. Her face—what could be seen of it under the muffling hood—was a trifle perplexed. "I don't know how to treat you," she confessed.

"Treat us with good manners," suggested Hudspeth, "and ye can't go far wrong."

"First," said the girl, "thank you for coming to my rescue just now, when—"

"Thank this man," Hudspeth told her, laying his big hand on Wingate's shoulder. "I think ye already know Mr. Wingate, my lieutenant and secretary of state?"

He went on to tell how Wingate had evolved and put into practice the plan for crippling the Venusian. "In any case," Hudspeth finished, "our government may be in trouble with Venus over that blast-bunt. Ye will bear us out, I hope, that we saved ye? Earth will stand by us—and maybe Mars, yer ally?"

Other figures were coming from Carthage's ship—fur-clad men, with weapons. "Everything all right, skipper?" one of them asked the girl, plainly looking to be ordered to shoot. But she

shook her head dolefully.

"I'm afraid," she said, choosing every word with slow care, "that these gentlemen were here before us. Their claim looks good to me. Let me go back to the ship, and get our government on the televiso."

She went. Wingate was aware once more of how cold and naked was the world of Ulysses. At the open hatchway of the Terrestrial ship lingered two bundled-up men with electric-automatic rifles. They looked direly anxious to shoot somebody. But Hudspeth betrayed no worry.

"Earth will never kick us loose from our winnings now," he said confidently. "Yer lady friend shouldn't be talking to her home over any radio device—for now Mars will tune in and overhear, and Jupiter's moons, and Venus. None of them will let Earth claim Ulysses."

"You mean, they'd prefer to have us win?"

"Of course. Haven't I explained how Ulysses is too great an advantage for one world? With an independent government springing up, the old status quo is maintained. Each world stands to protect us from the others. It's as I hoped—freedom, safety, and limitless concessions to make."

When Carthage came out, she announced briefly that Earth's government had recognized the sovereignty of Duke Hudspeth, and would urge other worlds to do the same.

NIGHT FELL—apparently Ulysses revolved once in thirty hours—and there was festival aboard Carthage's grounded ship. She graced the head of a long table in the salon, and Hudspeth sat at the foot, with the crews of both craft lining the sides. Wingate sat at Carthage's right hand, and Carthage treated him with an embarrassed respect.

"I'm king of this world," Hudspeth said, in response to cries for a speech. "King—because I always thought that a

proper king would be the best sort of ruler. The only trouble with monarchies is the individual monarchs. I hope to have sons some day, and that they'll be better kings than I. My first decree is that Ulysses will be open to settlement by any person who will recognize my authority."

He sat down amid thunderous applause.

"You've already got some settlers from my own party, your majesty," said Carthage ruefully. "Among others, my second-in-command is resigning to stay here. I hope you'll leave me some hands to work my ship back home."

"Oh, naturally," agreed Hudspeth. "Haven't ye sold us supplies on credit? Haven't ye won yer own world's recognition for us? And haven't ye entertained us as even royalty has seldom been entertained? I won't leave ye shorthanded."

"But I need a lieutenant, to stand the other watch," Carthage's green eyes turned appealingly upon Wingate. Hudspeth noticed, and his big face cracked across with a knowing grin.

"I'm sorry, Skipper, Dawes. Mr. Wingate shall not be yer second-in-command."

"Oh," said Carthage, in plain disappointment. "I had hoped—"

"He will be my envoy to Earth, carrying greetings and treaty suggestions. I'll want some sort of interplanetary structure set up for my government by the time Ulysses comes into its orbit. But, if you carry him in your ship, I make no doubt he'll take care of a watch for ye. Yet he'll not be subordinate to ye." Hudspeth smiled from her to Wingate. "Bygones being bygones, can't the two of ye get along on equal terms? Talk it over on the return trip."

Carthage smiled dazlingly at Wingate, who became aware that Hudspeth was drinking both their healths.

IN TIMES TO COME

The next Astounding, of course, begins Dr. E. E. Smith's great "Gray Lensman." I can truthfully say that it is certainly one of Dr. Smith's best yarns. That's rather unnecessary, though; all of Smith's stories are events in science-fiction.

Incidentally, I'd like to point out here and now, hoping to save disappointment in months—and years—to come, that you'd better plan now to not only buy the next four issues of Astounding containing that novel, but to *keep* them. Past history suggests: (a) that this novel will never be reprinted in any form—none of the others have; (b) that the supply of back copies—though we will, as usual, lay up a supply of several hundred—will be completely exhausted long before Smith's next novel is written, and (c) that securing those back copies after about June, 1940, is going to be a task to be undertaken only by the persistent haunter of secondhand bookstores. People are going to want them, and are *not* going to be able to get them.

Those with foresight might plan to preserve those four copies now and save themselves trouble in the future. It always happens. We average here about three letters a week asking for back copies containing "Galactic Patrol." We don't have the February, 1938, issue containing the last installment—haven't had it for months. Requests for "Skylark of Valeron" still average about one to two a week. The last complete set of those issues was exhausted sometime in 1936.

Because of the great length of that first installment of Dr. Smith's story, the number of stories in the October issue will be smaller than usual. To make up for that, the October issue is going to offer a collection of star stories. It will open our seventh year, so I naturally want it to be good. With the terrific competition of "Gray Lensman" to face, the shorter stories have to be good.

There will be "Habit," by Lester del Rey, one of Astounding's new "old favorites." John Berryman, author of "Special Flight," has another story, "Space Rating." On the list of stories to come next month, or in months soon after, are "Discord in Scarlet," by A. E. van Vogt—who, as predicted, made a first-place for himself on his first story, "Black Destroyer." Lee Gregor, who wrote "Heavy Planet," has another unusual story about a big, slow ox of a man, whose brains were in his hands, and wanted to fight dragons in the Twenty-third Century—"Shawn's Sword."

You know all those names—know them for top-rankers. Do you notice that each of them is a product of the last of so of Astounding's efforts to find new top-rankers? Things don't happen that way so consistently by chance; another one of the Things to Come during Year Seven of the Street & Smith's Astounding can be predicted: Astounding will find and develop not less than four now-unknown top-rank new authors during the next year.

THE EDITOR.

THE ANALYTICAL LABORATORY

Somewhat pressed for space by "In Times to Come," the ratings for the July issue appear below. Notice that, as promised, A. E. van Vogt has proven himself another of Astounding's new top-rank authors.

- | | |
|----------------------------|----------------|
| 1. Black Destroyer | A. E. van Vogt |
| 2. Greater Than Gods | C. L. Moore |
| 3. Trends | Isaac Asimov |
| 4. City of the Cosmic Rays | Nat Schachner |
| 5. When the Half Gods Go | Amelia R. Long |

THE EDITOR.

ATMOSPHERICS



By VICTOR VALDING

ATMOSPHERICS

Static in the English meaning—but static in the breathing, in this sense! It got the signals wrong!

By Victor Valding

Illustrated by Mayon

L.

PERCHED on the chromium bar stool, an open book propped up against a jar of pickled eggs, the white-haired old man trembled in sheer vicarious excitement. That fictional hero, the redoubtable Peter Allan, was crashing down into Jupiter's crushing gravitational field with pirate vessels practically prodding his afterjets with their meteor-scarred noses.

Reaching blindly for his glass of beer, the old man downed it, never taking his eyes from the thrilling "Tale of Two Suns."

Simultaneously Half Ton Harry, the barkeeper, shut off the ragged rhythms of the Martian orchestra on the radio and switched to the police band.

"Calling all cars," a voice cried. "Proceed at once to spaceport. Attempted robbery of cargo being unloaded from the S. S. *Stargold*, just in from Callisto. Thieves are holed up in station lounge. Use caution; they are well armed. Calling all cars—"

The lanky old man snapped to attention, spilling the free glass of beer which waited at his elbow. He heard a muffled oath coming from a darkened corner booth near the door.

"Don't get excited!" he called in friendly tones to the booth's occupants. "Harry just tapped another keg; there's plenty for all!"

No answer came. Two men—undoubtedly Earthmen—arose from the booth and departed, small cases under their arms. Protectorate workers, the oldster thought, seeing the customary white bands on their sleeves. He did not glimpse their faces, but something about the large, hatless, bald-headed man struck a responsive chord of memory—his very size, his baldness, his gait.

"Here's your beer," Harry interrupted.

"Calling all cars!" the police announcer's voice came.

"Harry," said the aged one, "it's a shame, these goings-on! Thievery and such. Aren't there any ethics in the System any more?"

"You should talk, Hugh Ventrome!" the fat barkeeper laughed out. "Drinking when you should be at work!"

Hugh shot a startled glance at the clock. It showed 11:58 p. m.! He was due on watch down in Air Control in two minutes flat! Finishing his beer, he hitched his lean, slightly rheumatic frame from the stool and departed.

Once outside the photocell-actuated swinging doors, he called a greeting after the two Earthmen who'd been in Harry's. They made no acknowledgment, simply walked swiftly toward the darkened Meridan Corporation Building. Fire, but they were congenial cusses! To think, with all the sullen natives around, guys wouldn't even be

police to their own small group of fellow men who were stuck in this little Martian spaceport town!

Pursuing his own slow path in the same direction, Hugh Vendrome turned his slightly myopic blue eyes up to the low-hanging, atmosphere-retaining dome of the ancient city—just to tempt the youth that was still in him with a glimpse of the stark stars out there in space.

Fire! It never failed to come back—the sweet longing to get far past that transparent ceiling and into the paths of the meteoric winds that sweep between the worlds. Tough to get old and be planet-bound. Tough as hell!

His eyes were a little moist as he neared the Meridian Corporation Building deep in whose sub-basements was his destination. Air Control with its innumerable gadgets controlled the artificial-atmosphere units and kept life within this surface city of Delova while oxidized, ozone-drunk Mars slowly expired without.

Delova was asleep now, snoring under the beneficence of electro-thermic radiation and the guardianship of the Air King. Hugh frowned at the city, remembering back to his impetuous youth when he and Shan Warner, the pirate, had come down on a similarly nightclad Garna, the Jewel City over in Syrtis Minor. But he mustn't think of those days. They were far better forgotten, however virile and swash-buckling they had once seemed.

Now he was a trusted, honorable man, an eight-hour-per-day Air King; when on duty the actual master of life and death in all Delova, watch-stander in that small, centrally located room down in sub-level Ten.

But what a comedown that had been for a man of action: from the delicate T-bar of a super-stellatomic to the switches of the artificial-atmosphere units. Plenty of responsibility, though, for these units, scattered thickly throughout Delova, gave individual and

unique conditions of temperature, pressure, humidity, and air content to the various warehouses that specialized in the storage of fragile, perishable, and peculiar articles of commerce; to say nothing of the quarters allotted to visiting individuals from Venus, Callisto, Ganymede, Titan, and even an occasional hard-boiled—literally—denizen of blistered Mercury.

Hugh's thoughts were abruptly terminated. The two Earthmen had reached the passenger elevator leading into the sub-levels.

"Wait up!" he called. "I'm going down! Hey!"

But the door had closed. The old man swore softly.

AN ARMORED electric car rolled up from Spaceport Drive just then, escorted by several Martian officers on tiny atomocycles.

"Cover all entrances!" a sergeant barked. "Let no one enter except on official business."

He spun around to Vendrome. "And who are you?"

Hugh grinned pleasantly, extending the tiny golden badge which is an Air King's only identification. Then, since he was already late and precious seconds would be lost calling the passenger lift back up, he entered the freight compartment.

"Vendrome!" came a high-pitched voice from within the armored car's cab. "You're breaking regulations; take the passenger route!"

"Nuts!" Hugh said, grinning at McCormick, night manager of the sub-levels, knowing that the fat little cuss wouldn't be so bold without the cab's protection. "By the way, No-Less, whatcha got that started all the ruckus at the port?"

McCormick's wild mane of crimson hair protruded now from the opened window, and his florid face was contorted like a monkey's as he roared:

"Vendrome, you blasted barfly, it's none o' your damn business!"

"Fire to you now!" grinned old Hugh, enjoying this pleasant exchange. "And to think I ever tilted a glass with a red-haired ape like you!"

"Which I paid for with good Earth dollars and which you filled a score o' times to tickle that nose-cheating throat o' yours!"

Hugh was chuckling audibly. McCormick was spluttering threats and imprecations, and the guards within the cab were trying hard to keep straight faces when the elevator stopped at sub-level Nine.

Hugh grinned as McCormick directed the car into a hallway which took it to the far side of the level. Fire, but McCormick was the lad! Two drinks into him and he'd buy the rounds until he pined out. Two drinks—no more, no less! Which is why the nickname No-Less.

EXACTLY at five past midnight, the oldest stepped into Air Control, down in Ten.

As the evening watch slipped belatedly and blasphemously out of the door, Hugh eased his lanky and venerable frame into the beryl-steel dream of a chair, slipping the faded cushion into the small of his rheumatic back.

Sweeping a quick eye over all the meters and recorders, he instantly knew the status of the various atmosphere units.

Just then the telescorphone buzzed. Merely a routine call. An oxy-drunk Caliban demanding an immediate atmospheric adjustment. The Air King obliged.

Tilting the luxurious chair to a half-lying position, Hugh adjusted the soft pillow a lot, and lighted up his foul old pipe. When the latter was drawing to his satisfaction, and making Air Control the most ill-ventilated compartment in all De'va, he fell to studying the

memoranda left him by his predecessor.

A stellatonic trajectory in from Venus at three, bearing *twistra* which required special storage, and an ambassador who required delicate atmospherics in his boudoir.

Hugh Vendrome was a hundred and ten years old, which is rather aged by any standards, even those of 2297; but he didn't look it, sitting there. His hair, although snow-white, was as thick as ever, and his wrinkled old skin was ruddy and shining with health. His teeth were his own and sound as ivory. Also as yellow. That was due, no doubt, to his pipe, which a doctor had told him to quit about thirty years back. The doctor was dead now, but Hugh seemed likely to go on forever.

His twinkling blue eyes were still keen and bright, and his blue-veined hands were steady. His reactions were fast, his digestion good. Of course, he had had to stop eating Martian *squops*—the plant from which the native beer is brewed—for the somewhat indigestible vines gave him heartburn and the more exhilarating and more delicate flowers were too expensive. But he had his pipe and, off watch, his beer, and any number of good books to read, both here and there. The public library was a blessing to an old man who was cursed with black memories—memories which should dim and die but would not.

Yes, bitter memories.

You wouldn't have thought it, the way Hugh Vendrome acted, drinking, carousing, joking. And he was in a clear, happy frame of mind most of the time, for some of those memories were fine, and in them he lived when he was alone.

He'd just started wrong, that's all. Back when he was twenty he'd signed up on a Merulan Corporation freighter and spent some of the blackest hours of his youth swearing and sweating with the stubborn atomics. Hardly a job for a young fellow with the ambition to get

to the top real quick—and with a minimum of effort—burning in his brain.

He'd been glad when Stan Warner had signed him into his renegade crew back in the Mount Kenya port, Africa. Earth. Life had been easy and exhilarating albeit unethical, until he met Vingy Lavoanie on Venus, Vingie who had brightened his life for a moment and left him with a new and finer code of ethics.

But he'd better attend to business. That damned Callistan was getting the bonds now from a sudden, violent drop in pressure and an excess of nitrogen. Why in the deuce didn't those birds evolve right? Delicate as a bunch of Venusian violets!

II.

MEANWHILE, lots of things were happening in and around the sub-levels of Delova, Mars.

Out in a side branch of the intercity subway's electromagnetic system a tiny self-powered tubecar hung, buoyed up by the repelling electric fields. It poised there, well off the straight Delova-BuYi route, and waited.

Two well-dressed Earthmen wearing the band of the Protectorate, and carrying small cases under their arms, entered the Rathskeller in Nine, and ordered double Scotch-and-sodas from the pretty waitress who came to their booth.

The large, bald-headed one said softly, reassuringly to his young, nervous companion:

"Keep your chin up, Nils. It's a cinch down here. Up above, there were too many cops; but they're still up there, see, and we don't have to go back up. Canavan's got the tubecar waiting out in the subway.

"We'll go into McCormick's office—customs inspectors, remember—and that's all there is to it!"

The good-looking youth looked around apprehensively.

"Yeah, yeah, I know," he whispered.

"But it's too risky. You heard the radio in the bar—Sam, Joe, Bob, Dan; they all got it! And we'll have the whole Meradan Corporation on our necks if we try to pull anything after what's already happened!"

"Sure, kid, the first job seems hard. It did to me, see! But we've got nothing to worry about. We just wait until the armored car's gone back up; then we go into McCormick's office. Everything is fixed for our escape. Once in the tube for BuYi and we're set! BuYi's outside of the Protectorate! And you're not backing out now; you know too damned much!"

"Shut up; she's coming with the drinks!"

SHE—the jaunty little cap atop her golden hair was labeled "Marie"—smiled at the young Earthman as she set the drinks before the pair. In this dead spaceport town it wasn't often that you saw people of Earth ancestry, especially handsome and broad-shouldered young men.

"We're customs inspectors, Nils and I," the bald man said. "We've urgent business with Manager McCormick and suspect that hashish has been smuggled in with that last shipment of gems from Benares, India, Earth. We must see him as soon as possible."

"I think that will be all right," she said, smiling sweetly at Nils and addressing the other. "You can talk to him now undisturbed. There were some men with him but they've returned to the surface. Mr. McCormick is in his office, weighing some cargo just in from Callisto—"

"That's it!"

"I beg your pardon?" Marie asked.

"That drink hits the spot," the bald one amended.

They finished their drinks quickly, tipped her generously, picked up their cases, and went out into the hall.

Absently Marie placed the dishes in the automatic washer; then she decided

to go down to Air Control and see dear old Hugh. That young fellow—Nils, the stern man had called him—was so handsome, so different from the coarse fellows who came in on the freighters. She'd like to tell the Air King about him; Hugh knew so much about the affairs of the heart.

There wouldn't be any more customers, probably, until after four, and if there were, they could put their coins into the automatic mixing units. There really wasn't much work for her, anyway, with all the robot equipment around.

IN THE MAIN office, warehouse three, sub-level Nine, McCormick was engaged in weighing and tagging a number of lead pellets about ten centimeters long by three thick. As he worked there alone, he mumbled to himself in a tone that indicated great annoyance.

"Damn!" he was saying. "Here I am McCormick No-Less—oh, plague take that nickname, anyway, and plague take that Hugh Vendrome!—night manager o' the whole sub-level, weighing lead pills like a drugstore clerk. O' course, the fact that there's a spot o' radium in each pill might alter the matter. But the same, done by a clerk, would let my tired old body rest o' nights, 'stead o' being used for a target by a bunch of crooks!"

"Damn, but I'm sleepy! One o'clock in the morn is no fit time to be working. For a young, romantic fool like I used to be, sure and one a. m. was fine enough. But not for work, then or now!"

"Why in the name of Saturn's girdle do Callistan express ships come in a night? They could come in much better at noon, with the blessings o' No-Less, 'stead o' at midnight with his curses. Well, soon done!"

He paused a moment as a light flashed. Another subway tubecar com-

ing in from BuYin and he knew what was going to happen. The Martian intercity tubecars, drawn and pushed by electromagnets, were whoppers, indeed!

When they went through, the powerful magnetic fields that swept past with them absolutely ruined the action of any automatics ever devised. Vacuum tubes refused to function, or else the plate current ran so high that the tubes were ruined; magnetic relays clicked shut or pulled open when they should have remained at rest; and each piece of electrical equipment reacted crazily to the forces that whizzed through it.

McCormick grinned. A thought struck him, a thought which consoled him in his own misery. Every time a tubecar went by, skinny old Hugh Vendrome became a madman. Control of atmospherics normally was automatic, but for as long as twenty seconds before and after a car passed, the ventilation system and special units in the sub-levels were disarranged, and that called for delicate manual adjustments.

No-Less dropped the last pellet delicately on the scales just as the tubecar's electromagnetic maxima passed, and the weight jumped up to twenty kilograms!

"Damn!" he swore, pulling his red hair in irritation. "I'll fire that Air King. I'll can him proper. Damn his old bones!"

The fact that the Air King was in no way responsible for the magnetic field racing past did not lessen the manager's determination to discharge him; nor did the fact that old Hugh was up to his scrawny neck readjusting the atmospherics in this and that enraged Venusian's or Callistan's or somebody's boudoir.

"Inefficiency! Incompetency! Probably came to work half pepped, too, the old scarecrow!" McCormick reeled as a sublime whiff of pure oxygen issued into his nostrils from the intake vent. "I'll set 'em up, boysh. . . . Shurrrr, have this one on me. . . . Ooops, I'll

see to that Vendrome, giving me a shot like that!

"Now what's this? Somebody at the door? Well, they'll wait until I get this blasted radium stored away!"

III.

HUGH VENDROME was chewing his fingernails about the dreadful plight of the beautiful heroine of "Tale of Two Suns" when Marie came in. He looked up, smiled rather sadly, and motioned her to a seat on the bottom of an upturned wastebasket.

"You'll pardon my not getting up," he apologized, "but as a man gets on in years, he loses the ability to jump up quickly and bow to a lovely lady. But, if he has lived a clean, liquor-free life, he manages eventually to get up!" He made a very unsuccessful attempt to rise, and sank back on the faded pillow which Vingie Lavoanle had weaved for him back there on lovely Venus.

"Now what brings you here, light of my old heart?"

She dimpled prettily, and Hugh felt something tugging mightily and painfully at the strings of his heart. Her smile always made him think of Vingie—think back to those days fifty years before when he and Vingie were man and wife, back when she had dissuaded him from his life of piracy under Sham Warner. Not that he'd regretted that life, though, for he'd never slain a man, only robbed the overrich and profiteering trade companies of valuable cargoes; but he'd come to regret it that far-gone night when the police had come for him in the Honeymoon Hotel at Palivanyi, Venus. One of them, a hasty, young fool searching for stripes, thought he was reaching for a gun as he'd started to drag out his pipe. Firing at Hugh, he had missed. And Vingie, her chest sundered by the explosive pellet, had died there in Hugh's arms.

Marie's voice brought the sad old

man out of the hindersweet mists of memory with a rush.

She was telling about a couple of Earthmen who'd been in the Rathskeller. Must've been that precious pair he'd seen in Harry's.

"The older man called him 'Nils.' Gee, he was swell; big and strong and dark-haired! But I didn't like that bald-headed man. Do you suppose—"

"Eh? Hell's fire! Pardon! No—Less can take care of himself. And there's nothing funny about customs inspectors coming around this time of the morning. When a guy in this racket can make overtime, he'll stir around at any hour.

"And don't you go falling for any young twerp; you're to marry me as soon as I get my old-age pension!"

It was so like Vingie's smile, that which curved Marie's full, sweet lips, Hugh felt a moistness in his eyes and blinked around to the televisophone. He was cursing at the Callistan who'd gotten a whiff of orone as a tubecar momentarily short-circuited the atmospherics at his side of the sub-levels and who just had to scorch the very roof of the great air dome with his fiery complaints.

Marie slipped out then, so Hugh gave the Callistan a whiff of rotten-egg gas with a vengeance, and then proceeded to make the screeching alien as comfortable as possible.

Fifty years since Vingie died, he was thinking. Ten years in prison; then thirty years of jumping around the System with the patrol until old age had grounded him here, and Dewitt Meridan III had made him an Air King.

Fifty long, empty years! Hugh cursed, and wished the Callistan would kick up another fuss. He had a lot of freak atmospherics in his bag of tricks, and he felt like socking somebody with them.

Sitting there ruminating, he decided to get McCormick on the televisophone

and burn him up with a Calvinistic treatise on how much and how little a man should drink. Switching on the T V P's receivers, he paused before giving the buzz. Doubtless No-Less had been about to ring him, for the circuit was open from the other end.

He saw the whole scene rather vaguely, for the three people were somewhat out of focus, being away from the iconoscope's short-range scanners.

The two men he'd dimly glimpsed up in Harry's Bar were facing a very startled McCormick. The bald-headed one was training an expel-pellet projector on No-Less' protruding stomach and saying:

"How about handing over that radium, McCormick?"

His crimson face apoplectic, the dumpy manager drew inspiration from the very air he breathed, and lied very glibly: "There's a visual plate in here and you are already under the observation of the police. If you kill me, they will release prison gas—"

The Air King's screen went blank as an arm, distorted by proximity with the distant scanners, strapped off the switch. But his own hand did not dart over to dial the police!

Hugh Vendrome's past came back like some ebony-winged thing of fantasy, folded dark pinions, and dug piercing talons of memory into his shrinking soul. He knew now why that older man's appearance had stirred him so uneasily. That man was Ved Warner, son of Shan Warner, the pirate to whose flesh and blood Hugh had sworn undying allegiance. Ved Warner, with all of Shan's physique, Shan's baldness, Shan's virility, Ved, who'd been born on Venus but a year before Hugh had left Shan's renegade crew forever.

The old man settled back on Vingie's pillow, and lighted up his foul old pipe with a twisted grimace. It might, he thought hesitantly, be interesting to see if they really could get away with it!

But out of the dim reaches of time sweet Vingie's voice seemed to come again and scold him as one might scold a child.

IV.

ABOVE, on Nine, McCormick was thinking fast. They hadn't shot him, but they'd heeded his warning about the gas and had donned tiny masks. Now, if Vendrome had only been on the other end of that T V P which he'd managed to sneak open—

Ved Warner and his young companion were looking at the safe.

"All right, McCormick, open it up!" snapped Warner.

"Can't! There's a time lock that won't be allowing it to open until tomorrow. That's all there is to it!"

"Oh, no, it isn't! Get the torch out, Nils."

A wild hope leaped into being within No-Less. As soon as the bald man burned through the first layer of the safe, an automatic alarm would go off down in Air Control, and the old Air King would send police to the scene within a few seconds! Breathlessly McCormick waited.

The pair had come well equipped. Nils had plugged a transformer-rectifier unit into a power outlet and was attaching a compact, torchlike mechanism that was nearly the absolute ultimate as a heat producer.

Quickly Ved Warner donned a pair of welder's goggles over his small gas mask, and pulled on a heavy metallic apron and a pair of insulated gloves. Taking up the torch, he set to work.

The blindingly white flame leaped at the safe, spewing sparks and bits of molten metal against Warner's clothes—flame resulting from energy unleashed in the loss of mass as helium atoms were bunt from the hydrogen streaming across the jet outlets.

It was a small safe, and had not been built to withstand the disrupting force

of an atomic torch. Had Warner been less upset by the previously open television circuit, he might have had the door open in a few minutes; but he bungled the work and fused the lock. Like some great god of wrath in his dark goggles and gas mask, his bald pate glistening with sweat, he began to cut out the entire lock mechanism.

Nils stood with an explo-pellet gun trained on McCormick, and his darkly handsome features were twisted in thought. This promise of easy takings wasn't such a quick and easy procedure as Warner's words had made it seem. God, why hadn't he stuck to the atomics on that freighter? Why hadn't he?

IN AIR CONTROL, Hugh Vendrome was thinking the same thing. Finally he threw his reeking old pipe across the room, and surveyed the thermometers with a worried eye. The office in Warehouse Three was heating up considerably; Fire Control would probably give him a ring in about three shakes!

Sure enough, here they were, telling him to cut in the refrigerating units! Now, if he didn't cut those units in, he'd go up on the Meridan Corporation carpet sure! So he cut them in, paused a moment in deep thought, and then very deliberately—and very illegally—kicked off everything in Nine from the other levels. At least, that would keep the police out, and the thieves in until—until what? Old Hugh Vendrome's thoughts were in chaos.

Sure, he was reformed. Sure, he had cast off the dark cloak of outlawry. Sure, he had sworn to Vingie and, later, to the Interplanetary Patrol—sworn that he would follow the straight and narrow, and he had!

But, Lord, can you expect a man to forget a blond-brother oath sworn in his wildest moments? Can you expect that of him even though formaldehyde replaced the blood in the veins of Shan

Warner over forty years before?

That oath had been a very solemn thing to Hugh Vendrome. He'd been young then, and looking for an easy way to riches, and Shan had given him the opportunity. The worst part of it was that it had not paid. It never paid in the end because you lost all you won, and all you loved, too.

When his record was up to the minute, he looked back at the thermometers, and cut in three more coils to the refrigerating units of McCormick's office. Retrieving his battered pipe, he began to tamp tobacco in its mellowed bowl.

Leaning back on the faded cushion, he lit his pipe and began to meditate. "Fire, but all I'm doing with my refrigeration is keeping those thieves comfortable while they doubtless burn up the safe!" Oh, well, they must figure they'll get away with it. There's that damned T V P again!

Nervously he snapped on the televisophone's audio.

Marie called excitedly: "Hugh, there's something wrong up here in Nine. All the doors and elevators are locked!"

"Yes, lovely lady, and it looks as if there were some thieves in McCormick's office, the way the alarm's sounding off." Mind you, he didn't say there were any! That wasn't breaking an oath, was it? Or was it?

"Oh, Hugh, not him! Not Nils!"

"I wouldn't be a-knowing," Hugh said gently. "Don't worry, honey; everything will be all right!"

"He is up there!" Marie cried with that eternal intuitiveness which is woman's. "Oh, Hugh!"

"Damn!" Hugh said vehemently to himself as he disconnected. Things certainly had a fine way of messing themselves up! Time repeating itself. The vagaries of fate. He thought of other years, of another lovely lady who'd met destiny when her lips touched his. And now, Marie and this Nils.

The priority buzz interrupted his thoughts. He switched on the T V P, and a heavy, emotionless voice called: "Turn on your visual."

"An Air King may not reveal himself or his station at any time," Article II, Section 5, Meridan Statutes," Hugh quoted. "And who are you?"

"Karli Garlon, prefect of police. You're the Air King?"

"Yeah," answered Hugh, not bothering to be courteous, for he liked neither Garlon nor Garlon's tone. He almost wished he hadn't weakened and given Marie the hint which had caused her to warn the inefficient Martian police.

Garlon went on flatly: "We want to put poison gas in the ventilation intake of Warehouse Three, main office, sub-level Nine. Where will we find an inlet on the duct?"

"How about McCormick, the night manager? He's in there, too, isn't he?"

In the silence that followed, the Air King could just imagine the Martian shrugging his sloping shoulders.

The old man thought fast. He didn't want to see McCormick killed—McCormick who drank and joked with him, and who had brought him companionship these last dull years.

"Where'll we find an inlet?" persisted Garlon.

Hugh was tempted to snarl back, "I wouldn't know!" and break the connection; but he controlled the impulse and said:

"If those thieves were smart enough to get down into Nine with their blasting equipment and to . . . er . . . luck off the entire sector, they probably brought gas masks with them. So poison gas won't work. You'll just have to break down a door and go in and get them!"

There was a long silence. Finally Garlon came back: "Maybe you're right. We'll play the waiting game." The audio died.

That damned Martian had less back-

bone than an angaba! Waiting game, nuts!

Hugh lowered the already-subzero temperature in the fussy Callistan's boudoir, made a brief entry in the record, and pulled at his pipe reflectively, his thin face twisted and wan.

Too bad Shan Warner's son was up in McCormick's office, otherwise he could have gassed the lot of them with no compunction at all. But then McCormick would have got it.

Too bad Marie had fallen for that Nils—but hadn't another woman as lovely as she fallen for him and reformed him?

Maybe there was something, after all, to the myth of those three sisters, the Fates. Surely they must spin the same threads often through the long years—

THE T V P buzzed. The prefect of police again, and Hugh almost cursed at him.

"Look, Air King," came the heavy voice. "We've got to know the location of that inlet. We've got to put in the gas!"

Sure, what was McCormick's life to him? He, Garlon, had to have a perfect record! The Meridan Corporation, which owned most of Delova, wouldn't tolerate inefficiency!

"What of McCormick?" the oldster demanded hotly.

"The radium in that office is worth the lives of a hundred men! So tell us—"

"Sorry!" snapped Hugh. "Tubercar going through. I'll call you back!" Angrily he broke the connection, not at all bothered by the lie. Another tubercar wasn't due for several minutes; but when it did come he'd be so busy that he wouldn't have one chance in ten of saving McCormick.

The insidious voice of a guilty conscience whispered in his brain. "You've broken that oath, Hugh Vendrome," it said.

Shan Warner's ghost would be eternally in his soul, anyway, now, so he might as well break that unholty oath completely before that stupid Garlon questioned another Air King who was off watch and set his men to killing McCormick.

To hell with the Warners, father and son. What had either ever brought him but mental agony? The past was dead!

If he didn't do something immediately, Ved Warner and that precious Nils would be getting the radium, killing McCormick, and burning down the rear wall of the office to escape. They probably had a small, self-powered tubecar waiting out in a side branch of the subway's electromagnetic system which would take them to almost any Martian city outside of Earth's protectorate. The unpoliced tubes would give them a perfect avenue of escape.

His thoughts raced. What to do? Temperature? No, it was impossible to get it high enough to burn them out; and he certainly couldn't get it low enough to freeze them out with an atomic torch doubtless blasting away in there!

He couldn't cut off the oxygen, for as soon as their lungs started to labor they'd leave the radium and run for their lives. But wait! It was carbon dioxide that— *Fire, he had it!*

Turning to the controls, his fingers racing, he used nitrogen to keep the air pressure steady to McCormick's office and cut the oxygen down to zero.

"Now to be sure that the CO₂ is down to a minimum," he muttered, keeping a cold, calculating eye on his mixing panel. "And I'd better call the hospital and get oxygen tanks down there to revive them."

Turning to the T V P, he called the surface hospital and bellowed: "Emergency case. Oxygen starvation, three men, in sub-level Nine, Warehouse Three, main office. And wear oxy-masks!"

V.

VED WARNER was just finishing the cutting out of the whole safe door. He had fused the lock beyond opening with his nervous fumbling of the powerful torch, and had been reduced to burning through the periphery studs on the door.

The safe was nearly red-hot, its front a sagging, white-hot mass that slumped floorward with incandescent, running edges. Warner stood as close to it as he could, finishing off the last stubborn studs.

With a grunt of satisfaction as the door dropped free, he shut off the torch and put it down. He turned to speak to Nils, but never made it.

Warring, he stood irresolute for a moment, and then his big body toppled—dropped backward squarely upon that incandescent mass.

Fiercely, briefly, his clothing flamed; fiercely, briefly, his body steamed and fried and broiled.

Nils and McCormick saw nothing of this, for they had preceded Warner into unconsciousness by a few merciful seconds.

DOWN IN TEN, the aged Air King noted the temperature drop in McCormick's office, and, praying that it was not a sign that the thieves had fled, praying that he had not failed, he unlocked the level above.

Simultaneously an elevator slipped down to Nine. Four white-garbed intermes, carrying stretchers and resuscitation-units, came forth and headed for the warehouse office, oxy-masks on their faces.

One glance at Warner's destroyed body atop the rapidly cooling safe door and they passed it by.

Silently, efficiently, they pressed special oxygen masks over the faces of the two unconscious men and started the portable pumps.

Up above, on sub-level Eight, the police waited patiently. The first thing they knew of the unlocking of Nine, the capture of one of the thieves, and the rescue of McCormick was the passage of two stretchers up the main elevator.

Karli Garlon, startled from his complacent stolidness, was informed by the hospital men that he could dispose of the corpse that lay, a charred and smoking mess, across the misshapen slab of metal that had once been a safe door.

Back in Air Control, Hugh switched in the automatics again, thankful that the latest tubecar was past. Six more hours, and his watch would be over. "Wonder what happened above?" he thought. "Nobody ever tells me a damned thing!"

HEARTBREAKINGLY the time dragged on. The T V P buzzed. Hospital connection, Hugh noticed, and his old heart skipped a beat, for he knew at last that he had not failed.

This time it was Marie. "Nils is just fine!" she blurted first; then, "Oh, how did you do it?"

"Simple," Hugh declared modestly, cutting in the visuals so that Marie could see how proud he really was. "Reduced the oxygen content to zero, and kept the air pressure up with nitrogen. Kept the carbon dioxide down to a minimum. Since it is an increase of CO₂ in the blood that makes a man start

breathing heavily and makes him uncomfortable when the air gets foul, the two thieves and No-Less just passed out from oxygen starvation of the brain, without ever knowing what hit them. Hope they're recovered!"

"Recovered? The big man died!"

The old man went white; but he didn't stay white long, seeing her haunting face so sweet there on the visual grid.

"Marie," he said, striving to drive the huskiness from his voice, "I hope you're not serious about this Nils. You'll just find heartbreak all your life if you think you'll wait for him. He'll go to prison sure—"

"McCormick just promised that he'd see that Nils is released in your custody! You see, he was just swinging the gun on the bald man when Air Control dropped him. And he told the police about another fellow who had a car waiting out in the tubeways—"

A strange little smile, half joyous and half poignant, played on Hugh Vendrome's wrinkled face, and the joy of having something to live for and work for sparkled in his blue eyes.

So No-Less had wished the job of reformation on him, Hugh Vendrome! Must've figured he knew a lot about it! And, Lord, how well he did!

"Congratulations, lovely lady!" he said, wishing his voice wouldn't quaver so. "We'll do our best!"

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THE LAST HOPE



By DON EVANS

THE LAST HOPE

A dozen old men with weapons and fanatic ideas vs. two young people without!

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I.

THERE was a crashing of underbrush. With a magnificent bound, a fine young buck catapulted from cover and soared over the granite sarcophagus marking a grave in the overgrown clearing. It fled on into the depths of the forest at the same frightened speed. There were other sounds of something drawing nearer.

There was another crash, followed by a low-toned oath of impatience. The stalwart, muscular blond youth, dressed in a bit of leopardskin, with bow and quiver, limped from the woods painfully, rubbing an elbow with an exasperated frown.

Now in hand, he mounted the sarcophagus, listened intently. His gray eyes were severe as his questing gaze followed an avenue of stately cedars fronting a row of mausoleums. He located the buck by the sound of its swift flight and then, leaping down lightly, took up the chase again.

At the end of a brush-grown avenue was a ruined fountain whose overflow once fed the hly basins to his left. Beyond it, was a magnificent, tall, narrow structure in porphyry and green jade with prismatic windows of thick crystal. The lowering western sun penetrated the translucent tower making a kaleidoscope of moving color where the light struck the foliage of climbing vines.

He cast a brief suspicious glance at the broken bronze doors, yawning into blackness, and gave the place a wide berth, for these ruined tombs were the favorite haunt of leopards and other wild beasts.

The buck was now beyond hearing. The youth cursed the vine that had tripped him at a crucial moment thus making another long stalk necessary with the buck grown alert with suspicion. With frowning gaze questing for tracks, he loped on into the gloomy depths of the forest.

The trail led in and out among granite pillars, between mossy headstones, and past marble statues peering fixedly at him from the gloom. The great trees towered above and shut off the light, their mossy boles mottled and splotted with gray-green patches of lichenlike vegetable leprosy. The air was warm and dank with the smell of lush bracken and the deep, rich, rotting mold of the forest floor.

Half a mile the trail led through the sumber shades until the land began to rise, with copper-tinted sky through the trees beyond. Skirting a pyramid of black glass and green jade with trimmings of lacquered copper, the ruins of extensive hanging gardens about it, he increased his pace to a swift run, thinking to catch a glimpse of the quarry on some open hillside ahead.

But, emerging from the last of the trees with the lowering sun square in

his face, he was brought up short with a cry of consternation. Shielding his eyes with a hand, he remained staring with open mouth, dumfounded and thunder-struck.

Far away across a shallow valley, he saw the tapering spires and rounded domes of a great city thrusting into the blue. Sunlight gleamed in iridescent hues on translucent green jade and rose quartz, on dark porphyry and snowy alabaster. Tier on tier of elevated highways rose and vanished in opalescent glory. But not a sound broke the afternoon quiet, not a vestige of movement was discernible anywhere about this stupendous monument to a vanished race.

A lone buzzard wheeled in leisurely circles in the brassy air above.

He lowered his hand slowly. Dead cities he had found by the score, but no such vision as this, ethereal as a mirage on the desert. Tearing his eyes from the sight with a last thought for the buck, he swept the hillside to right and left. The immediate gentle slope falling away from his feet was dotted with row on row of crosses, hundred of thousands in neat geometrical precision. But he was used to these unending burial grounds and scarcely gave it a thought. There was no sign of the buck.

To the south, down the broad valley, a few ungainly camels were filing through a tongue of meadow between the tentacles of heavy forest. To the north, he saw a herd of buffalo on a rounded grassy knoll in the center of the valley. The horizon on every hand was all a dark line of unbroken forest.

Towering marble pillars nearby drew his attention and he picked his way through the crosses until he stood beneath the soaring curve of a great arch. Far above, on its yellowed keystone, was the single word "Elysium." A broad highway passed beneath the arch, dipped as it crossed the valley beyond, and rose again in graceful curve as it headed straight for the city. Its concrete was

broken and disrupted, with brush and saplings sprouting through the cracks, but its level surface drew him on.

Fascinated by the shimmering loveliness of the dead city atop the far hills, he forgot the buck in his excitement and stepped out swiftly. His bare, horny soles trod warily, but his long legs carried him swiftly, nevertheless, although he could seldom wrest his gaze from the spires and pinnacles ahead.

AS HE WENT, his eyes scanned the forested valley from time to time. He started as he made out a peculiar movement. With head craning forward in alert attention, he scrutinized the spot for it was like nothing in nature he had ever noticed.

Midway of the valley was an extensive grove of dark cedars in what seemed to have been a park long before. The grove was bordered by the silver thread of a stream that meandered aimlessly through the almost flat land. Above the center of the grove, something was rising and falling in swift, rhythmic motion. It created a trembling excitement in him with its air of artificiality which suggested humans in an otherwise dead world.

The city was a good ten miles away, however, and the day was fast drawing to a close. The cirrus wisping overhead was blood red. Blue shadows clothed the dark grove of cedars to his left when he had picked his way across a ruined bridge. He saw red tiled roofs and translucent pink and rose-colored walls in what appeared to be well-kept gardens. There was a steady creaking sound coming from somewhere behind the building.

The place stirred his curiosity and he paused in indecision. There was something about the motionless, lifeless silence of the city that was ominous. As it grayed with approaching dusk, it seemed sinister. It was too far away to reach before dark and he felt a disinclination

to go farther. The red tiled villa stirred his interest and bred a longing to explore.

He cast a glance back the way he had come. Beyond the lofty arch, dwindled now with distance, the highway entered another fantastic city on low hills where enormous pyramids and mausoleums thrust up from the encroaching forest. In the other direction, the dull-red ball of the sun was sinking in rose madder haze behind towers and domes that had blackened in silhouette.

Dusk was falling fast and he decided that he could explore the city on the morrow. Casting a dubious glance at the villa, he again felt the certainty of people about. For some unaccountable reason he shivered as he turned up a broad, white drive in good state of preservation. Brazen doors hung open invitingly in the long, low building, but an ominous feeling, steadily growing stronger, caused him to make a wary circuit of the place.

The villa was still in good condition and its translucent walls seemed to scoff at secrets. But his keen woods-trained senses seemed to feel eyes peering, watching, noting his every move. The creaking sound continued. He knew that it came from just about the place where he had seen that strange movement above the trees. He continued on through the grove by way of a well-marked path. The existence of the latter strengthened his suspicions to certainty. Only humans and animals made paths and it was not likely that animals had beaten a path to the back door of the building.

At the edge of a clearing, he stopped in suspicion at sight of a huge windmill whose arms slowly revolved in the breeze. A night-born wind was turning the vanes faster. The cool fingers of the breeze made him shiver as they crept down his naked spine. The cedars were now black and the shadows beneath them heavy. The grove was eerie.

Casting an uneasy glance about, he felt the skin prickling on his neck as it did when he was stalked by some silent predator in the forest. He debated with himself whether to remain here or not. A sixth sense warned him of something nearby, but could not tell him what it was.

A closer inspection showed him that the mill was not much like the other building. Where the villa was old and beautiful, the mill was much newer and ugly. The first story was rough stone. Bark still clung to some of the squared logs above. It appeared to have been put together with difficulty. There was a vast difference to the artless perfection and unstudied skill of the villa.

The rugged ugliness had a friendly feeling. It was familiar to him because of the timbered hut in which he had been born and the other rude cabins he had found in the North. And there was no more time to explore before dark. He decided he might try the house in spite of its annoying creaking sound.

Its rough pine door was also open. Approaching cautiously, he thrust his head inside the door and peered about. The sense of humans alive and near was strong. But he could see nothing. Darkness was intense in the interior.

Then, just as he was about to draw back in doubt and indecision, there was a whistling pop behind him, his knees gave way with a jerk, and blackness swooped down as he pitched forward.

WHEN HIS senses returned, he found that he was stretched out on something level and soft. He was first dimly aware of several blue-white globes dancing in the air above him. Then he made out curving silver handles with human hands attached. He sat up with a start.

"People," he said.

There was a murmur of comment around him.

Shaking his head to clear away the fogs, he found his eyes focusing again.

He saw a rough-timbered roof above. Faces took shape, at first wavering uncertainly, then growing clearer until they had attained the fixed character of reality. He made out several gray-haired old men, dressed in skins like himself. They were grouped about him and looking down with a peculiar intentness.

It was completely dark outside now. Olaf had no notion of how long he had been unconscious. He saw that the globes gave a bright light after all, for the room was brightly illuminated. The lanterns were globes of glass filled with some bluish-white radiant substance. It was a pleasant glow, but he blinked rapidly and closed his eyes. Something was still the matter.

"At least he speaks English," remarked someone dubiously.

Olaf opened his eyes and examined the speaker. He saw a tall, old man with dark saturnine countenance and snapping black eyes. They all seemed pleased about something.

"A fine specimen," remarked the tall one, holding his globe high and scrutinizing Olaf appraisingly from head to foot.

The youth, feeling heavy and inert, swung about and lowered his feet to the floor. He was on a rude wooden cot. They all backed up as though they were afraid of him.

His initial surprise at finding people had given way to a profound satisfaction. He looked from one to the other expectantly. Six, he counted, all old, gray-haired, emaciated. They were still examining him with that pleased and speculative air.

"Excellent," remarked the tall one. "Couldn't be better for our purpose. He comes of sturdy stock and has youth, health and strength."

Olaf regarded him quizzically. He felt like some dumb animal on display, or, as if the others were some queer type of foreigners who did not expect him to speak their language.

The tall, dark one had been fingering his chin judiciously. But now he glanced about with quick, nervous energy. "We will get busy at once," he decided, with a tone of authority, and motioned the others from the room.

"Wait a minute," exclaimed Olaf, starting to his feet. "What is all this about? What happened to me?"

But the men filed out without answer. One of them pushed him back at the door, which was slammed in his face and locked. It was a stout door and well set in the stone wall. There was a barred opening in the upper half through which one of the old men was still visible.

"Let me out of here," cried Olaf in alarm and tried to shake the bars. He was unaccountably weak.

"Now don't you worry," said the old man through the bars. "Nobody is going to hurt you. But you're in quarantine, you see, and you can't get out."

II.

OLAF looked around the room. There was the cot he had been lying on, a rude table and a couple of chairs. One of the globes had been left for him. There were windows on three sides heavily barred with iron. The door on the fourth side was not the one that gave entrance to the mill. This was an inner room occupying about one third the ground floor. There was no way out save through the door where his jailer lounged.

He went close to the opening in the door and peered at the graybeard skeptically. He saw a leonine head of straggly gray hair and bushy beard, narrow shoulders, and a bit of wolfskin garment. Deep-set eyes with a haunted look, gazed back at him in friendly fashion. The old man appeared harmless, interested, and eager for company.

"It's a good thing you stopped here instead of going into Avalon as you in-

tended," the guard informed him. "The city is full of the plague."

The youth regarded him in perplexity.

"Oh, we know a lot about you," continued the old man, enjoying his surprise. "You were born in the arctic. You haven't seen humans since your father died. Your grandfather was a Swede, of hardy stock and used to a cold country, else you wouldn't be here today."

"He hated cities and crowds and when the wars started he got as far away from civilization as he could. Built a house seven hundred miles from the pole out of the timbers of his wrecked ship. When the plagues started, he even drove off the occasional Eskimos with a rifle. You've hunted and fished all your life, but you couldn't see any reason to remain in the arctic longer and you've been wandering south looking for humans for two years."

As Olaf stared back with amazement, the old man emitted a dry chuckle. "By the way," he added, "they all call me Johnny here. I'm the infant of the lot. You might as well call be Johnny, too."

"All right, Johnny," Olaf responded. "If you know so much about me, maybe you know what happened to me when I put my head in here?"

"Oh that," responded the other. He held up to view something that looked like a stubby, complicated rifle. "Neuroblast," he explained. "Numbs the voluntary nervous system. We thought we might have trouble with a husky youngster like you. The effect is harmless as an anesthetic and only temporary. You'll be all right in a few minutes."

Olaf gripped the bars frowningly. His joy at finding humans underwent some modification to find that they had shot him down, taken his weapons and cooped him up here. He moved his shoulders dubiously and felt of the back of his neck where most of the numbness remained.

The old man seemed to read his thoughts. "Absolutely necessary," he said. "You came through Elysium Heights, one of the cemeteries. The very soil is alive with the plagues. If nothing develops in a week, you'll be freed and we'll be glad to have you as one of us."

A week! Olaf used to the freedom of the forest, never having known constraint in a world devoid of humans, stared back aghast. He dimly understood quarantine. A little worried by the millions of graves he had seen since leaving the North, he supposed it was all for the best. With no desire to sleep, he felt some of the guard's inclination for company and satisfaction in conversation with another human.

The other was still garrulous. "We thought there were only twelve of us left," he said with satisfaction. "Forty years together in this God-forsaken hole! We're sick of each other. Glad to find there's someone else left in the world."

"I don't understand all this," mused Olaf. "How did you know that I came through the cemetery and that I was born in the arctic?"

The aged man surveyed him a long moment with speculative but friendly eyes. "You look like a good boy," he said. "If you'll give me your word not to escape, you can come out here and I'll try to explain."

OLAF readily agreed and the door was unlocked. He was conducted to a side wall where the old man held up his globe to light a complicated mechanism to which wires led from the room above. The youth, with no knowledge of machinery, gazed at the thing without comprehension. There was an instrument board beneath a large upright sheet of ground glass.

"Telepathic thought-wave receiver," explained the other with all the enthusiasm of a teacher coaching a backward

pupil. He pressed a button and the plate was illumined.

"Map of the vicinity. Hundred-mile radius," he said. "The black dot in the center is where we are now. Most important to locate people, if any exist, so we built this mill to give us a little power from an old-fashioned generator on the floor above. We used to have instruments with a thousand-mile radius when the big powerhouse in Avalon was working, but we can't get that kind of power now."

He paused as if to collect his thoughts and scratched his head dubiously as he looked at Olaf.

"The instrument employs two fields," he went on. "A beam and a band." Pressing another button, he caused a black line to appear on the map extending from the center dot to the far edge. "With this dial, you swing the beam all around the compass until you pick up the emanations. Accurate tuning was necessary when there were many people, for there might have been a thousand scattered along that straight line. You eliminate interference on the beam with the band, and vice versa."

He pressed another button and a black circle appeared with the dot as a center. As he manipulated another dial, the circle expanded and contracted.

"Where the beam crosses the band," he continued, "the emanations are accurately focused. That also gives us the point on the map from which the impulses come. We leave the machine turned on with the band extended to its utmost. If anyone crosses the band, as you did, there is a brief signal for the actual field is only a few yards wide. Then we adjust the beam."

"We've been following your wanderings that way for a week and have listened to every thought you've had. You kept on coming toward us, or we would have gone out to find you. The impulses come over the loud-speaker up there on the wall, and there is another

speaker connected in the laboratory, for we couldn't spare a man to operate the machine continuously. There are a set of headphones here, also. Now do you understand?"

At Olaf's blank look, Johnny frowned and snapped off the switches with a shrug. "Haven't you ever been to school?" he asked.

The youth shook his head, abashed at his ignorance. "There weren't any schools in the arctic," he responded. "I learned to read and we had a few books. My grandfather went to school somewhere."

"*Tsk, tsk, tsk.* I forgot," mused Johnny. "There weren't any school-teachers left. No schools anywhere, of course."

Returning to the other room, he pulled out the table and motioned Olaf to sit down. "I'll not lock you in again," he said kindly. "It's much nicer this way. But something must be done about this situation. You've grown up as ignorant as an animal. We're all old men here, ready to die. Knowledge will be lost with us."

"I'd like to learn about these things," replied Olaf seriously. He disposed his tall frame in a rude chair gingerly. His young face was sober. "But how?"

"Aye, how?" responded the old man moodily. "A great library with a million and a half volumes in Avalon, and we daren't go there. The place is a death trap. And we're all scientists here, so heavily specialized that our knowledge is worthless to the group."

He sighed heavily. "I was a chemist specializing in the reduction of wood pulp and the fabrication of artificial wood supplies. But what good is my knowledge now with the country all one big forest? America has reverted to the Miocene what with camels and elephants running around. All sorts of things escaped from zoos in the last days of the race. Most of them acclimatized and

multipplied. It's a wilderness paradise, if you like that sort of thing."

THEY WERE interrupted by the appearance of one of the others, a broad-faced old man with sloping shoulders. He came in silently on bare feet, frowned at the open door between the rooms, and directed a quick glance at Johnny. The latter, apparently in no fear of contagion, took no notice. The man left a tray and went out with a warning glance back over his shoulder.

"That's Trevor," remarked Johnny.

"Sober ass. I haven't liked him in years."

As they ate, Olaf identified a piece of buffalo meat. There were some good vegetables and a brown paste that puzzled him.

"Synthetic," explained Johnny. "Contains all the vital elements. We had to depend on that kind of stuff during the war. Can't make much of it now and it's no longer important."

Olaf studied the old man reflectively, wondering if the other were in his right mind. Little could be seen save his large, deep-set eyes and long, strong nose. Johnny had a habit of trying to brush back his long, gray hair, but an unruly lock always came creeping down again over his high forehead.

"You talk as though you had been through the war yourself," said Olaf.

"I was."

"But that was more than a hundred years ago!" exclaimed the youth.

Johnny nodded. "I'm a hundred and fifty," he said, surprisingly. "Some of the others are much older." Then, at the youth's baffled look, he added, "Protolamin. But I suppose you don't know about that, either. Secret of the protolamin immortality. Extracted from the amoeba. Only eminent men had it because it was very scarce.

"Individual amoebae may die by accident or disease, but each living individual is a bit of immortal protoplasm

that has been growing and dividing since life began. We might have lived a long time yet, but we can't make protolamin, now. The treatment has to be renewed every twenty years or the effect wears off. We'll die soon, like everybody else."

Olaf noticed that the old man's eyes were growing heavy. Soon Johnny was nodding. He watched with amused interest, not yet knowing what to think of these humans. Presently Johnny was fast asleep with the neuroblast across his knees. Arising quietly, Olaf picked up the weapon and examined it gingerly. But he could make nothing of its complicated mechanism. He laid it carefully on the table.

A sound drew his attention to the window, and he started as he gazed into the glowing orbs of a leopard just beyond the bars. Chasing the beast away, he glanced around again. He was able to see the value of the bars, now. The place was not a prison. The bars were to keep wild animals out and not to keep humans in, for the windows had no glass. A lusty snore from his companion settled his last doubts. Johnny was sleeping so confidently that suspicion vanished.

Olaf told himself that it would probably be easy enough to escape, but he no longer wanted to. He felt an overwhelming urge to remain and learn more about things. His abysmal ignorance troubled him. Stretching out on the cot, hands behind his head, he stared at the ceiling, thinking of the things he had heard.

But a huge drowsiness was stealing over him and he was soon fast asleep.

III.

HE AWOKE with daylight dulling the glowing globes. Unaccountably weak, he staggered as he arose. Johnny was swearing in the other room.

"I don't like it," the old man stormed. "They've been in here. The neuroblast

is gone. The outer door is locked so I can't get out. Maybe they think I should be quarantined, too, for getting so close to you. Maybe they distrust me for not keeping a good watch."

"I feel dizzy," remarked Olaf.

The old man peered at him fixedly. "We were drugged," he decided vehemently. "I haven't slept well in years. Never slept sitting up in a chair in my life. I woke up on the floor. There is something going on here."

Olaf was conscious of a twinge of pain. Looking down, he found a red puncture in the hollow of his left elbow.

"I don't remember getting that," he mused.

Johnny looked at the puncture and examined his own arms critically. "They've drawn blood from you," he decided. "It's Terkov. . . he's the tall one. He was a chemist, too, specializing in colloidal compounds. Nearest thing to a biochemist we have left."

As the youth looked his incomprehension, the old man continued: "He's had an idea for years that we could continue human life synthetically. We're all men here and not a woman left. It was a line of experiment that had progressed far at one time but had to be given up during the war when all our efforts were turned to destruction instead of creation."

"Oh, so that's it," frowned Olaf. "I dimly remember him saying something about youth, health and strength. So he wants to experiment on me? Like hell he will!"

Johnny's bright eyes surveyed him shrewdly. "That's it!" he exclaimed. "They expected you'd put up a fight about it so they drugged the food. I ate some, too. I guess that lets me out."

"I thought Trevor looked at you in a funny way."

"I missed it," admitted Johnny. "Guess my eyes aren't as sharp as yours."

"What is Terkov doing?"

"He's got something that will take the place of the ovum," answered the other, "but no one was ever able to create the vital male element. As soon as we located you, he took a chance and went into Avalon for books and materials. He's been in quarantine, too, so I don't know what he has been doing lately."

"A few weeks ago he showed us something that looked like a jellyfish. It was protoplasmic and alive, but if it could reproduce it would reproduce its own kind, and that is not the object. They did that long ago. He's formed the egg substance, and now he's got to create the sperm cells."

"Human cells are no good. They're already created. His protoplasm might produce something that way, but it would be a monster, and that's not the object either. There are enough beasts running around, now. He's got to create the vital male element and thoroughly understand it in order to control it and produce something human."

Johnny combed his beard, eyes serious, and sadly shook his head. "Men spent their lives on that and got nowhere," he added soberly. "It might have been done at one time. But not now. Not now."

As the sun rose behind Elysium, Olaf wandered to the window and scanned the grove with a frown. Terkov's egg had an ominous sound.

"What does Terkov want with blood?" he queried.

JOHNNY, with the prospect of a week's imprisonment ahead, had gone to the receiver and was pushing the buttons. "Don't know exactly. It's not my line," he responded absently, dialing idly all round the compass. "I fancy he thinks if he can get the various types of human cells to reproducing, he may solve the problem of the sperm. He's bled himself nearly dry over it. Probably been up all night."

"So now he expects to drain me!" began Olaf angrily.

But just at that instant the loud-speaker made a gritting noise. Olaf looked at the old man questioningly.

"Something crossed the land!" cried Johnny in excitement and dialed furiously.

"Drat the little beast!" said a voice from the air above them and Olaf glanced up in astonishment. He surveyed the speaker in awe. But Johnny was glancing at the intersection on the map. It indicated a spot far to the east.

"Now I've got you," went on the speaker. "Oh, you poor little thing!"

"A woman!" exclaimed Johnny under his breath. Reaching out quickly with palsied hands, he pulled a switch which disconnected the speakers. He adjusted the headphones with trembling hands. "O Lord, I hope they didn't hear," he muttered.

As Olaf looked on bewildered, Johnny turned a quick glance over his shoulder. "Go to the window," he directed hurriedly. "There may be men working in the gardens. See if they've noticed."

Olaf leaped to the opening looking toward the villa and saw two men hoeing in the gardens. But they were doing it mechanically with no thought for anything else. He was drawn irresistibly back to the receiver.

"It's a woman all right," Johnny told him, listening intently. "She was chasing a lawn when she crossed the land. Going fast, that's why the first signal was so brief. She's caught it now and is talking to it. It's been hurt by some animal. The signals are clear because she's talking out loud."

Olaf hung over the old man's shoulder impatiently. As Johnny continued to listen, the youth stole back and forth to the window to keep watch over the men in sight.

"Here comes breakfast," he said.

In trembling agitation, Johnny snatched off the switches and removed

the headphones. He literally dragged Olaf into the other room and pushed him down at the table. They were loafing like bored prisoners when Trevor arrived. Johnny eyed the latter sidelong, but apparently the other men had not been in the laboratory and had no notion of the event.

Olaf was still a little skeptical about the old man's state of mind and regarded the other dubiously when Trevor had gone. "What's it all about?" he wanted to know.

Johnny was too excited to eat and pushed away his plate. "This changes everything," he declared. He surveyed Olaf's calm demeanor and brushed back his errant lock impatiently. "Don't you see what it means?" he queried, annoyed. "The human race can go on! She seems young and healthy, like yourself. It's up to you two."

The youth regarded him quizzically.

"I won't have Terkov interfering," explained Johnny hurriedly. "While he's just fooling around with synthetics, I don't mind. Keeps him out of mischief, at least. But this is too important. I can't trust him with this woman for he'll probably want to experiment on her, too."

Johnny frowned a moment grimly. "I didn't intend to tell you," he added seriously, "but Terkov is a schizophrenic—split personality, you know. Nine tenths of the time, he's a brilliant man, but he takes fits of brooding—we all do—and he gets queer ideas. If something upsets him, he's liable to be violent. We've even had to shut him up in the jail."

Olaf still failed to grasp the point.

"We're all too old," explained Johnny impatiently. "There were a few women scientists left when the plagues died down, but they were old, too. We were all old before we were deemed worthy of procreation. It extended the life period of the normal healthy individual, but did not extend the pro-

creative period. These of us who are left are just the lucky ones who not only escaped the plague but had protolamin. There were no children among us."

"Let me listen," insisted Olaf.

Johnny adjusted the earphones for him and then strolled about the room in deep thought. He peered from the window from time to time.

"We'll have to be resigned to quarantine," he muttered. "No one else must get near the machine."

"The voice is fading," said Olaf.

"Draw in the band," suggested Johnny.

Olaf soon had the trick of following the girl with the dials. He listened to the unknown in fascination.

Johnny was worried. "If she keeps on coming this way, all right," he said, half to himself, "but, if she goes the other way, we've got to be free to follow her." He stared at the bars a moment and then relaxed in deep study.

Disliking Terkov, as he had from the first, Olaf saw the point. Johnny went to the window and lounged against the frame trying to look bored. From time to time, Olaf drew in the band.

"She's coming this way!" Johnny exclaimed.

AS THE conspirators listened, taking turns at the instrument, the band continued to grow smaller. By noon she had accomplished about ten miles. They already knew much about her from her active thoughts.

She had been born in the northern Adirondacks of old pioneer stock. Intensely independent, even secretive, her ancestors had had no use for society and had scorned the cities. Keeping sedulously to their rocky hills, they had been untouched by the war and had somehow escaped the plagues. She was the only one left. Like Olaf, she was just wandering from place to place with curiosity leading her on.

After lunch, there was a change in the

situation that caused Johnny some worry. One of the men came with the neuroblast and began loafing nearby, apparently keeping an eye on the mill. Johnny shut off the receiver and they talked at random, in case they were overheard.

"Quarantine is just isolation, you know," he commented. "As long as we keep away from the others, we should be allowed to go fishing."

He winked at Olaf slyly and the latter cast a glance at Gissing, a crooked-nosed man whose eyes were set too close together, who was doing nothing, stupidly, not far away. Olaf grinned, beginning to see that behind the old man's tortuous mental processes there was considerable shrewdness.

"Now I regard fishing, as a most useful occupation," continued Johnny. "It keeps you out in the open, gives you beneficial exercise, helps the table, and, in addition to all that, it's fun. That's why the others don't like me. They're all so deadly serious that they regard fishing as 'mere childishness. They think I'm a little crazy.'"

He studied the youth critically.

"Gardening is the only other useful science we have left," he said. "We have all the usual things for this latitude and have even made improvements. None of us knew anything about it, at first. We just picked it up. That's what I intend to do with fishing. I'm not good at it, but you know all about that and can teach me."

Olaf felt better to find that there were some things he knew of which Johnny was ignorant.

"You will teach me?" pursued Johnny.

Olaf nodded.

"It's my opinion Terkov could be better employed, too," the old man continued. "Finding a way to make clothes, for instance. Of course, we could make none of the spun glass and cellulose garments we used to have, although the latter was along my line. We couldn't

go back to old-fashioned textiles because there's no cotton around here and all the sheep are wild. Still, we should be able to do something. It's a great inconvenience in the winter."

"Do you think she's still coming?" whispered Olaf.

"Sh-h," responded Johnny. "Gissing is coming closer. I don't like this at all."

IV.

"TELL me more about things," requested Olaf, his gray eyes eager.

"Gosh," the old man returned, "with anyone as ignorant as you are, I wouldn't know where to begin."

They took chairs to the window and tilted back at ease where they could keep Gissing in view until they decided what this new factor might mean. It was apparent now that he was some sort of a guard.

Johnny reflected a moment, still dubious of Olaf. His self-appointed task as educator was assuming mountainous proportions.

"Guess it all started back in the third and fourth decades of the twentieth century," he continued. "Science used to be a poor man's hobby. Rich men weren't interested and poor men weren't financed. Science didn't amount to much.

"But with the breakdown of the old investment system, wealthy men had no place for their surplus funds. Taxes grew heavy. So a small group of financiers conceived the idea of putting their wealth in subsidies to science, taking control of basic patent rights in return. Patent rights became the wealth of the world and science went ahead by leaps and bounds.

"In 1905, Bowen succeeded in smashing the atom and, in quick succession, Aldrich accomplished the low-wave broadcast of power, and Kane's receiver, the rotodyn, quickly rendered obsolete the Diesel, the steam engine, and all

other forms of power that had been used up to that time.

"So a small group of promoters found themselves in control of the world's machinery. They built great power-houses for the broadcast of cheap power used by the rotodyns. Manufacturers could no longer compete, using the old expensive forms of power, so they had to have our machines. Every rotodyn turning throughout the world paid royalties to the promoters who were soon enormously rich.

"Then, in 1920, Hood isolated protolamin. It was only available in microscopic quantities and so was monopolized by Hood's sponsors, the same group of money barons. It conferred extreme longevity and they were able to go on corraling the world's wealth until most of it was in their hands.

"They created the Avalaine here in what used to be the old States of Nebraska, Kansas, Iowa and Missouri. There were already rumblings of war in the world so Avalon was built as far as possible from either seaboard. The Avalaine, with its cheap power, became a great manufacturing center. The money kings brought most of the world's greatest scientists here and so we had the advantage of a monopoly of brains and intellect.

"The control of power was soon slipping, as some countries revolted and seized our power plants, and patent rights ran out from time to time, but still our inventive ability kept us one jump ahead of competition. We had high-speed automatic machines for every purpose and so could produce goods cheaper than anyone else. In order to compete with us, manufacturers had to have our machines, and so the world continued to pour its wealth into Avalon."

Johnny leaned back at ease with vacant eyes lost in the past.

"There was never anything like it," he reminisced. "We soon had a popula-



"Now stay here," the oldster snapped. "You can't fight a neuroblast, and you may as well realize it."

tion of ten million. It was the greatest city in the world. Everyone wanted to live in Avalon, but citizenship was restricted. We had no illiterates, no imbeciles, no loafers, and there were few

physically below par. Crime hardly existed. That was why we not only had the genius to manufacture the jade, quartz, onyx, marble and so on you saw in the city . . . much more beautiful

than the scarce natural product . . . but also the greatest artistic talent in the world to work with it.

"Everything else was the same. Avalon became the world's cultural center. The greatest architects, artists, writers, poets, musicians, thinkers were all ours. The barons stripped the world of its art treasures for our benefit—"

Johnny paused. Olaf was trying to get the picture the old man had drawn. He glanced over and saw the old man's chin sunk on his chest. Johnny's eyes were closed. The contrast between the emaciated, ill-kempt graybeard in his ragged wolfskin, sitting bare-legged on a homemade chair, and the scenes he had called to view was so great that Olaf was uncertain.

"Tell you about it, sometime," muttered Johnny in his beard. And Olaf saw that the old man was so disturbed that he forbore to question further.

GISSING left at supper time and they tuned in on the unknown. They participated in the chase of a wild pig and her preparations for supper. At dusk, they listened with hearts beating fast while she was pursued by a pack of wolves. She climbed a tree and remained awake late. As the evening wore on, the pair forgot their caution.

Terkov, having been up all night, had slept during the day. He was still about. Both conspirators started at a sound on the path outside and turned guiltily to see the lean, dark old man looking in a window. Terkov came in abruptly.

"What are you two up to?" he demanded angrily, his bloodshot eyes flashing. He noted the loud-speakers were cut off and threw the switches scowlingly. His black eyes snapped from one to the other as he listened.

No sound came from the instrument.

"I was just explaining how it works," remarked Johnny, striving to be casual. He was trembling in fear lest the voice sound again and give everything away.

Terkov was still suspicious. "Hereafter, you will do your listening with less privacy," he snapped. "I don't want to find that turned off again."

He stepped outside the door, looked toward the villa a moment, and then shouted impatiently.

Cold sweat had broken out on Johnny's brow. "Where. That was a close call," he whispered.

Olaf was puzzled. "Is the thing out of order?" he asked.

"No. She's gone to sleep," replied Johnny.

Terkov, Gissing and another came in. The tall leader had the neuroblast which Gissing had fetched along. "We're ready for you, now," said Terkov, nodding at the youth.

"Look here—" began Johnny angrily.

Olaf leaped to his feet. His eyes narrowed dangerously as he surveyed the trio advancing upon him.

"What are you going to do?" he demanded.

His aspect was so threatening that Terkov paused in his tracks. He knew he was no match for the muscular youth. Raising the neuroblast callously, he took aim. As Olaf made a bound forward, there came the same hissing pop he had heard once before. He crashed to the floor unconscious.

Johnny was stuttering in rage at this high-handed treatment.

"Get back," warned Terkov, turning the weapon upon him. And as Johnny paused in impotent rage and indecision, the leader calmly nodded to the other two. They heaved Olaf from the floor with some effort and carried him out.

The latter came to himself in the same slow fashion as before to find himself back on the cot again. As he struggled to sit up, he found that his arms were tied behind him. His feet were free, however, and he arose dazedly.

Johnny was outside the other door again, looking in through the bars. Olaf

swore furiously and the old man peered at his rage in indecision.

"Better be quiet," Johnny advised. "It's no use to struggle."

"What have they done to me?" raged Olaf.

"They took you to the laboratory," shrugged Johnny. "I'm in quarantine, too, so I don't know what they did. They've still got the outer door locked so neither of us can get out."

"That Terkov!" fumed Olaf. "I'll—"

But he subsided in spluttering futility. "They figured you would feel like that about it," the old man told him. "But, if I were you, I'd be good. We can't antagonize them now and stay penned up here at this critical time. We've got to have our freedom so that we can go look for the girl."

"Why?" demanded Olaf in alarm.

"Because Terkov was suspicious," responded Johnny. "They've taken the receiver away and strung a power line to the other building. Now they'll know about her as soon as she wakes in the morning."

"If they think I'm going to stand for this, they're all crazy," declared Olaf. "Maybe my grandfather was right. He always said the human race had gone stark, raving mad. I want to get out of here."

"YOU DON'T want to live all alone in the world, do you?" asked Johnny. "It's not pleasant. And if you do escape, I won't have anyone to talk to. I'm tired of these other fellows. We can't think of anything more to talk about. We just quarrel. I hope you'll reconsider."

Olaf was not certain whether he liked people or not. Up to the present, the impression was distinctly unfavorable. "You're all right," he said sullenly. "It's Terkov. I hate him already."

"That's the way it always was and always will be, I suppose," mused Johnny. "As long as there are people, they will disagree about things. But

I've seen enough of fighting. Why don't you be good and not spoil our chances?"

At Olaf's quick look, he added: "They've told me I can untie you if you are reasonable. They've also told me that if I don't make a good job of guarding you, they'll put Gissing here. You wouldn't like him at all. He'd keep you tied up all the time."

"I see," responded Olaf. "I'm willing to be good if they'll let me alone."

Johnny opened the door and began to unfasten the bonds. "Mind you stick to it," he warned. "We've got to regain their confidence somehow, so that we can get out."

"Can't you disconnect the generator so they can't hear?"

Johnny shook his head. "Daren't do it with things in this shape," he responded. "It's out of our hands for the time being. They'll hear the girl and go get her. We'll have to let them do that and think of something else."

Olaf stabbed a questioning look at him.

"She was coming straight for Avalon," explained the old man. "If we could only think of something in time, we could head her off. But we'll have to leave it up to them, I guess. If she keeps on that course, she'll see the city, and curiosity will lead her into it. She'll be doomed."

"Can't we do something?" demanded Olaf.

"Not while we're prisoners," returned the old man. "Most important thing right now is to let them steer her around the city."

Olaf paced around the room, sat down, got up, and finally paused in the center of the floor angrily.

"What have they done with my weapons?" he queried.

"I fancy they are using them to hunt," replied Johnny. "They were much better than our own bows and arrows."

Olaf was surprised. "You can make things like the neuroblast and the re-

ceiver and can't make bows and arrows?"

"We didn't make those things," responded the other. "At least not here, under these conditions. There were vast quantities of some things, mostly war materials and supplies left in Avalon. A lot of it is still there, although much of it is no good now."

"We brought a few things with us. But the neyroblast is a short-range weapon—we don't use it for hunting. Anyway, there are only one or two charges left in it. Takes a long time to charge it on our small generator."

Olaf's eyes narrowed as he stored that piece of information for future reference.

"We're practically out of everything," sighed Johnny. "Even simple tools have worn out."

"I don't see how they can find her," said Olaf.

Johnny stretched out on the cot, placed his arms behind his head, and crossed his ankles.

"That will be easy," he returned. "We still have several radio helmets left and our power is sufficient to operate them. Someone will remain to operate the receiver and keep the girl marked down on the map. The others will be directed to her by two-way radio."

Olaf scratched his head in exasperation. "I thought they'd need me to track her down," he said disgustedly. "Every time I get an idea, you have some infernal machine to make it useless."

"Machines are better than humans for some things," reflected Johnny. "Too good, sometimes. Machines are like a race of insensate people, both clever and stupid. They were our slaves, once. We fed them with power and made them work. But the slaves rebelled. They wiped us out."

"How was that?" asked Olaf in surprise.

V.

"OURS WAS a mechanical civilization," the old man went on. "It backfired on us. We invented so many high-speed automatic machines for our cheap power that manufacturers, elsewhere, had to have our power and our machines in order to compete with us. The result was that three quarters of the human race became unemployed and lived in abject misery. Machines led to unemployment, which led to wars, which led to plagues. We had started something we couldn't stop."

Olaf wrinkled his brow as he regarded the old man with patience.

"We were able to keep out of the wars for a long time," Johnny continued. "But, as they spread, we turned more and more to the manufacture of munitions and supplies. The barons were greedy for more money. When the wars had spread all over the world, other countries were in difficulties and had to come to us for what they needed. We provided their weapons, explosives, gases, and so on, and invented new things for them. As they got in greater difficulties, we even provided synthetic food supplies. They came to depend on us and the barons soon had what little wealth there was left in the world."

"Other countries were soon hopelessly in debt to us and there was no way to pay off. It was cheaper to declare war and repudiate. There was a little European war back in 1914 that had started the growth of the great empires. The Asiatic war with its humble beginnings in 1932 had created others. They were our best customers until they were broke. Then two or three of the empires got the same idea. If they could capture Avalon and control its scientists and vast munitions works, they could win out and rule the world. So we found ourselves attacked from all sides."

"They had rebelled and seized our

powerhouses for power. Then they copied our machines and weapons. When we found our own inventions turned against us, we had to invent still more deadly things in self-defense. Then they copied those, too, and so the process went on, with Avalon always one jump in the lead, but with the war growing more vicious every day. Then, when the six empires combined against us, we had to fight for our lives.

"Science changed the nature of war rapidly. In desperation, we concentrated on the senses of the private soldiers. Our resonators shattered their eardrums and disorganized their nervous systems. Our flash batteries blinded them. Our infrared guns and gases burned the skin off of them and left them exposed to tetanus, gangrene and blood poison. Millions who had invaded this country were left helpless. They were interned and later swept off by the plagues. So the common soldier ceased to be a factor."

JOHNNY looked over at Olaf, who had shuddered in horror. "I'm glad I was not alive in those days," the youth muttered.

"It was forced on us," explained Johnny, "and there was no place to stop. Every time we invented some new kind of a metal slave, we found it multiplying surprisingly among the enemy. All those metal men came marching back at us.

"We rendered some things futile, of course. The airplane had gone out of use because no device containing electrical equipment could get through the neutrality curtains we hung about our cities without wrecking every electrical appliance on board. Any ship containing men was useless. Our resonators blasted them apart, and our infrared barrage burned them out of the skies. So we used rockets loaded with explosives.

"They hadn't been able to copy our

infrared barrage when we developed detonite. That gave us an advantage, because our rockets could get through where theirs couldn't. We turned to long-range offensive measures against the vital nerve centers of the world—the crowded industrial and manufacturing points and transportation centers.

"A hundred pounds of detonite would destroy a fair-sized city. We got them one by one. Our rockets could get through the neutrality zones with a rocket charge after being driven close to their objective by the rotodys using the enemy's own power. We tuned the rotodyn equipment to the wave length of a powerhouse and let it go. It rode the waves to the source of its own power. It was like shooting a steel bullet at a high-powered magnet. We couldn't miss. The powerhouses were always located at the most strategic points. Detonite wiped them out and the cities with them.

"We gradually won out because everywhere else, wealth had vanished. The bulk of the population was reverting to the primitive. War and loot was the only way to live. Education had to be abandoned so that fewer and fewer scientists could be trained to fight us. As commerce was disorganized, starvation spread. Even such simple necessities as common sanitation had to be abandoned, so that pestilence reared its head to add to the general misery. When we at length had the commercial cities destroyed, the war began to die down. They could no longer get supplies and so had nothing left to fight with.

"But everything boomeranged on us. We had been forced to create such engines of destruction that a great part of the race was blind, deaf, or otherwise incapacitated. As the plagues took hold, they died by the millions. When we destroyed Tokyo with a thousand pounds of detonite, the shock caused an earthquake on the Pacific coast which wiped out our own Seattle. When we de-

stroyed world commerce, we destroyed the source and transportation of medical supplies. Even the simplest medical necessities became unattainable. There was no way to combat the plagues and they swept off those whom the wars had left. We had epidemics in Avalon, too, but through it all our medical science was able to cope with those things and they never became serious."

Olaf did not notice that Johnny had paused. He was fascinated by a vision of hurtling fleets of planes, loaded with death, crashing in the neutrality zones, and carrying helpless men to instant death. Of deadly rocket planes, with no land at the helm, blasting asunder in midair. Of detonite making matchwood of vast cities in the twinkling of an eye. Of helpless humans, blinded, deafened, burned, dying in droves from the plagues they could no longer control.

"You can see what happened," continued Johnny. "Never a shot or shell fell in Avalon. The city is as good today as when it was built. But a commercial city was no good without commerce. And you can't make money out of a war you have to fight yourself. It was all expense and no profit. Even the barons were soon penniless. They put the last of their fortunes into those fantastic tombs and mausoleums you saw in Elysium. Then there was nothing left. The rebellion of the slaves we had created was at an end, but so were we."

THE OUTER door opened abruptly and Terkov strode in. Olaf leaped to his feet belligerently with narrowed eyes and clenched fists. But the tall one had come without the weapon and merely motioned impatiently for Olaf to remain seated.

"Something very important," began Terkov, his deep, rasping voice serious.

Olaf refused to sit. Johnny, sitting about on the cot, lowering his feet to the floor. The pair stole an uneasy glance at

each other, wondering if Terkov already knew about the girl. But the latter was lost in frowning thought as though he hesitated to begin. A bony hand clawed his beard. When he spoke, it was to Johnny.

"As you know," Terkov began abruptly, "I've been experimenting with cells, the ultimate object being the male element. I've tried everything but the brain cells. The youth here possesses a healthy body, but the mind of a child. The others have agreed to draw lots for a simple trepanning operation. We need the trained scientific type of brain cell."

Johnny was amazed. "You can't grow brain cells in culture," he objected.

"I am doing it," responded Terkov impatiently, "but all nonhuman cells. I think you will agree that when we have all the human types reproducing freely, we will be well on the road to the accomplishment of our objective."

"But you're not a surgeon," retorted Johnny.

"Enough for the purpose," responded Terkov confidently. "It will be a very simple matter with no danger at all. Very little of the brain is actually used. Large areas, with no known function, have been removed without effect. I shall need but a few cells."

Olaf was regarding him skeptically. "You'll get none of mine," he said with conviction.

Terkov frowned slightly and surveyed him briefly with cold eyes. "We are not interested in breeding a race of idiots," he returned.

The youth flushed and took one angry step forward. Then, remembering the age confronting him, he paused almost wishing the other had brought the weapon. The leader had the unpleasant faculty of goading people to a desire for mayhem.

"You're crazy," muttered Olaf impatiently.

The effect was electrical.

Terkov sprang to his feet with a pierce-

ing cry. His black eyes dilated and his thin mouth worked. With flailing hands, he rushed upon the youth.

"Crazy!" he shouted hysterically.

Olaf caught him easily and pinioned his arms. Terkov strained and spluttered in impotent rage. Beneath his dark skin, the blood drained from his face until it was an ashy gray. He was almost frothing at the mouth.

Johnny had risen to his feet in horror. "Olaf!" he shouted. "Don't hurt him."

"I'm not going to hurt him," responded the youth angrily, wincing as Terkov locked, bit and scratched.

"Let him be."

Olaf pushed the man away impatiently. Terkov glared at him once, his face a mask of hatred. Then he ran from the room, and they heard him shouting insanely as he rushed up the path to the villa.

"Should have warned you about that," remarked Johnny soberly. "We have to humor him. If you were to call me crazy, I wouldn't mind. But Terkov goes wild. It brings on one of his spells."

"HE LEFT the door open," said Olaf quickly. "Let's get out of here. No telling what he'll want to do, now. Come on, before they bring one of those damned things that knock me out."

"I'm too old," replied the other, his eyes troubled. "I could never stand the life. You go ahead."

But Olaf hesitated. His glance lingered fondly on his aged companion. "I wish you'd come," he said earnestly. "I think this quarantine is a fake. They're keeping you penned up for something, too."

Johnny was tempted. "I'm beginning to think you're right," he muttered. "We could never trust him to perform an operation in his present state. And yet, if I know Terkov, he will insist upon it."

"Can't you see?" expostulated the

youth. "He only wants my body. He wants your brain. He'll demand more and more. And there's the girl. This is our chance to go after her."

Johnny sprang to his feet.

But before the pair reached the door there were sounds of bare, running feet on the path. They were confronted by Terkov and six others. Gissing with the neuroblast was prominently to the fore.

"Back!" the latter warned savagely, his narrow eyes snapping, as he swung the weapon from one to the other.

Olaf backed in helpless rage. Gissing had every appearance of a desire to use the thing on the slightest excuse. Olaf felt no fear of the weapon itself, since it was harmless, but was in horror of what might happen during a period of unconsciousness. Rage impelled him to violence. Caution urged him to conserve his senses in this situation. He was sure he could handle the lot, old as they were, but of what use was mere physical strength against such a force as Gissing itched to use?

He kept his scowling gaze on Gissing's hands while he sullenly submitted to having his hands tied behind him. There was still a chance while he remained in possession of his faculties. He stood glowering in indecision from one to the other. Johnny was being tied up in the same way.

"To the laboratory," commanded Terkov.

Olaf swore and heaved clear of the two who had him by the arms. He glanced at Johnny who was studying Terkov with troubled eyes. The latter seemed to have mastered his mania enough to hide it from the others. But, as Gissing tightened his finger on the trigger, Olaf subsided.

"I told you this quarantine was a fake," he growled at Johnny.

"Maybe you're right," mumbled the old man.

Terkov had started for the laboratory, but paused to glance back.

"Since you've taken this antagonistic attitude," he said vindictively, "we'll dispense with the trouble of drawing lots."

VI.

AS THEY entered the rear door of the villa, Johnny was glancing absently at the sky. Olaf was trying to think of some plan of escape without success. The place and the people began to look less attractive every moment.

They were joined by other old men for all had been aroused at the shouting. The youth saw that they were much alike—all aged, all thin, all clad in ragged skins. One snowy-haired old man appeared to be beyond the stage of usefulness, hobbling along with difficulty as he leaned on a staff. Evidently Johnny was the only one who did not believe in Terkov's ability, for the others all treated their leader with confidence and respect. He seemed to have recovered his composure.

On the way, Olaf formed some notion of the beauty of the place when it was new. All the rooms were on the ground floor surrounding an atrium, Roman style, except that the latter was roofed with glass. A fountain in the court was choked with weeds and rubbish and much of the glass had fallen in. The onyx and marble of pillars and walls were still as good as ever, but paintings on the walls and plaster on the ceiling had scaled away, leaving barren leprous patches as though the villa, too, had contracted some disease.

The laboratory, on the side toward the river, had been a spacious solarium. It was all tall windows in the French style, save for its small columns of translucent rose quartz. A large globe in the center of the ceiling shed a brilliant blue-white light. Olaf noted the thought-wave receiver installed in a far corner below a speaker. There was

no heavy electrical apparatus, because of the lack of power, and the scientists no doubt felt handicapped, but to Olaf the array of equipment and apparatus was bewildering.

Terkov, with some conceit in his ability, made a contemptuous effort to convince Johnny. He led them about the room displaying test tubes and jars which evidently conveyed something to Johnny but left the youth baffled. They at length paused before a large glass case on a low table. It was much like a large aquarium, wide and square, but not very deep. In a few inches of water reposed a large lump of some jellylike substance.

"Almost a perfect reproductive system," explained Terkov in the pedantic manner of a guide on lecture tour, "but as yet no brain and but a simple circulatory system. The alimentary system is almost nonexistent because it simply absorbs nutrition from our synthetic food material dissolved in the water."

"How could a human being be born from that thing?" demanded Olaf truculently as he stepped close to the case and peered in.

The organism quivered and moved. It seemed to be strangely agitated.

"The little red spot near the center is the heart," explained the leader, disregarding the youth's remark and pointing a long finger at a vague spot in the almost transparent mass. "You may observe the rudiments of a capillary system extending from it."

The aged scientist paused, finger extended, and scrutinized the increasing movements and convulsions in surprise. Olaf retreated a few steps, glancing about to survey the windows and their catches, still with some hope of escape. As he did so, the movements ceased.

"Come here," said Terkov roughly and drew the youth back. The pulsations began again. The organism was violently agitated and seemed to strain toward the youth. Terkov seized his

chen in a vigorous grasp and the others all studied the phenomenon with interest.

"This is something new," muttered one.

Terkov was puzzled also as he tugged at his beard a moment, then his black eyes glowed with a fierce light of triumph.

"It feels!" he cried. At their querying looks, he went on: "Being largely a reproductive system, this protean female is the concentrated essence of sex, we might say. It feels the presence of the male element. That means we have the beginnings of a nervous system!"

Olaf turned away, revolted and disgusted. But Terkov seized Johnny's ragged wolfskin in a fierce grasp.

"Don't you see?" he cried vehemently. "The developing circulatory system must be composed of human cells. The developing brain must be a human brain."

Johnny hitched his bound arms as though he would like to push back the lock of hair straggling down over his eyes. He looked decidedly skeptical and said nothing.

TERKOV turned away in impatience.

"Make ready," he snapped. "Gissing will stand by to see that there is no resistance. Anders and Trevor will prepare the subjects. Hoffman and Carter will assist me."

Olaf was prey to a mounting confusion. If this was knowledge, he saw nothing attractive in it. The plasm in the glass case was repellent. Their concentration was something ghoulish. Their present intention, to his simple mind, hinted more at madness.

In growing rage, he watched Gissing narrowly. But that suspicious individual, in turn, watched him like a hawk, with finger on trigger ready to send him into oblivion at the first false move. Olaf strained at his bonds futilely and glanced at Johnny. He could create a rumour, he knew, but it would

be of no earthly use once the charge of the neuroblast hit him.

Johnny did not appear to be apprehensive. Olaf was surprised when the old man closed one eye in a solemn wink.

"You guarantee this to be harmless?" the latter queried at Terkov.

The leader and two assistants were scrubbing their hands at a sink. He merely nodded, continuing his washing with an abstracted frown.

"Might as well trust to luck," observed Johnny resignedly.

"And Terkov," added that individual over his shoulder.

But Olaf felt no sense of resignation at such proceedings. With a sense of utter impotence, he felt himself being pushed upon a table one of the men had been scrubbing. He was forced down and stretched out flat. Johnny was being served likewise on another close by.

"I thought you didn't want my brain cells," Olaf growled disgustedly.

"We don't," replied Terkov, shortly. "But you have good healthy nerve tissue. We'll take some of that."

"A few microscopic cells," added Johnny reassuringly. "You probably won't even feel it."

Olaf was surprised at the latter's confidence. As they were strapped down to the tables, his eyes wandered about the place rebelliously. Dawn was making the sky a shade lighter. He eyed the array of test tubes and retorts nearby in alarm. He felt himself being dismembered and scattered about here and there, a bit in each glass. Such things suddenly became menacing.

With a sense of nausea and revulsion at the whole thing, he heaved against the straps holding him down. As Johnny had said, the survivors of Avalon were so heavily specialized that their knowledge was useless. The mad Terkov, invading a new field in perfect confidence, was ludicrous. Olaf felt the whole thing was useless and a burlesque on science. The villa was a madhouse.

Of a sudden, he knew he wanted to get out of here, to leave Avalon and never return. He was satisfied with ignorance if knowledge had come to this. Better no human society at all, than the society of fiends. To his inflamed imagination, they assumed the shape of monsters. He was disappointed with Johnny who was about to have a piece of his skull lifted without complaint.

"Let me up!" he roared, struggling frantically. "I won't stand for it."

But, if the bonds about his arms had rendered him helpless, he was now doubly impotent.

One of the men had gone to a cabinet where reposed some old though shining surgical instruments and some others obviously crude and homemade. Selecting an array of instruments, he placed them in a tray of boiling water. After a few moments of silence during which the barefooted men bustled about the last preparations, Terkov turned and nodded indifferently at Gissing.

"Administer the anæsthetic," he said coolly.

As Gissing raised the neuroblast, Olaf felt horror. He wished that he had taken a desperate chance and put up a bottle. With quick, burning hatred, he thought that he might have been successful in settling a few of them in such a way as to make them lose interest in this solemn travesty. He stared at the implacable Gissing with hatred.

The latter approached a step as Olaf struggled furiously and calmly aimed the weapon at his head. Gissing's face was wooden and emotionless. To Olaf, he seemed as much a personification of relentless doom as the hunter who draws his knife across the throat of a stricken deer to put it out of its misery.

Olaf gazed in paralyzed fascination at the small hole in the muzzle as it swung in line with his forehead. For a pulsating moment, he waited, breathlessly.

"Hush! It's daylight," said a voice

from the far corner. "I can get down from this tree, now."

Gissing paused and the weapon veered off until it pointed somewhere toward the ceiling. They all turned and stared at the loud-speaker. Trevor, the nearest, rushed excitedly to the instrument board and the others followed. The pair were forgotten. Even Gissing hastened to join the group.

"No sign of the wolves," said the speaker. "Another nice day. I'm stiff all over. Ouch! It was easier getting up here than getting down. There, now."

Wildly excited, the old men crowded together, staring at each other in amazement. A babble of excited comment broke out. Olaf was conscious that Johnny was looking at him from the other table. He found the old man grinning slightly.

"I expected that," whispered Johnny. "She just woke up."

THE OTHERS about Terkov soon realized the situation. As Johnny had predicted, when their first amazement had worn off they began laying plans to intercept the girl before she entered Avalon.

But the aged leader was frowning as he left the group. "So this is what you two were trying to keep from us," he said sourly. His dark face with pointed, down-drooping nose, prominent cheekbones and narrow black eyes had a Tartar cast as he surveyed them like some barbarian despot disposing of their future.

"Look here," said Johnny, wriggling. "This experiment business is unnecessary. That's a woman, young and healthy. She can take care of the situation. Why not let nature take its course?"

"Certainly not," retorted Terkov, elevating his head scornfully. "We can't wait on the slow, natural process. We will all be dead soon. Civilization will



"You can't get away!" the old man wailed. "They'll catch your thoughts!"

die with us. A race of savages would result. And, even if she had children, there is no guarantee that a further outbreak of the plague will not take them. We must be able to create dozens, hundreds, thousands of people. This woman is just what I need."

"What if she doesn't agree to it?" queried Johnny.

"With the future of the race in her keeping," responded Terkov, "she will have nothing to say about it."

"You haven't got her yet," put in Olaf.

"We'll get her," responded Terkov confidently. Absently he began to undo the straps that fastened Johnny to the table. "However," he added, "we will

postpone this for the present."

Back in the mill again, with Gissing standing guard outside, the pair surveyed each other. Olaf had definitely made up his mind and examined the windows, the floor and even the ceiling covertly.

"I hoped they would give us the neuroblast before she woke up," remarked Johnny in a low tone.

Olaf looked his puzzlement.

"Because then it would be empty," explained the old man, "and they wouldn't be able to charge it for they will need all their power in the hunt for the girl."

"Hm-m-m, you're not so crazy," murmured Olaf quizzically.

Johnny's deep-set eyes twinkled. "There are times," he responded jocularly, "when I fear I am quite all right. It will be nice to be with young people again," he went on in satisfaction. "I'm really too old to think of leaving here. We'll have to work the situation out somehow. The main thing is to find some way to control Terkov."

"And this Gissing," added Olaf in the same low tone. "If they weren't so darned old, I'd take a chance on cracking their heads together."

"You have the strength," agreed Johnny. "And also the inclination at present. You could lick the lot of us in a fight. But they know that. They'll not give you the chance. Terkov is really a brilliant man, and Gissing is no fool."

Olaf regarded his companion narrowly. "Terkov is making one mistake," he said seriously. "In regarding me as an idiot he forgets that I've hunted and have been hunted all my life. I've been in a hundred worse situations than this."

"You let him go right on thinking that," advised the old man shrewdly.

"I will," replied Olaf darkly. "But no mad man is going to keep me crouped up here while he cuts pieces out of me at leisure."

As the sun heralded another brilliant day, Olaf strolled to a window and studied Gissing unobtrusively. He eyed the man's scrawny neck with a calculating glance.

Just let him get close enough, he reflected. My hand will go around that puny neck. One good jerk of his head against these bars. He will drop the neuroblast, and I can take the key from him.

Whistling to himself, he stared at the grove and the bit of silver water just visible through the trees.

But the guard's alert gaze was on him constantly. Olaf's features were an open book. The suspicious Gissing read something he didn't like and was too wary to come close. He was never very far away, but sensed Olaf's hatred and kept clear.

VII.

OLAF AND JOHNNY looked up from the table where they were playing cards. The old man had been teaching Olaf the game to while away the days of waiting. As the door opened and someone was unceremoniously pushed through the opening, they had a brief view of Anders with his face scratched and one eye blackened. They surveyed the girl with interest.

She was not above medium height and slim with the trained athletic look that came from a strenuous life in the forest. Long, black hair made a cloak for her shoulders and below it she wore a soft brown otterskin. A small, round face turned toward them and deep-blue eyes, nearly black, smoldered upon them critically as they rose to their feet.

Glancing from one to the other critically, she fixed Olaf with a scathing glance.

"So you're the one," she remarked sarcastically. "Father of the Race, and all that."

Olaf was taken aback by the venom of her tones. He glanced uncertainly at

Johnny. He had always been curious about women, but had not expected them to be like that.

The old man politely offered the newcomer a chair and tried to make her feel at home. With a flirt of her shoulder, she went to a window and stood with her back toward them. She was evidently determined to hate them all. Ignoring Johnny's pleasantries, she remained staring at the grove, a slight frown on her brow, a bare foot tapping the stones of the floor.

"Do you play cards?" pursued Johnny.

But only cold silence rewarded him.

Presently three of the men appeared and much against his will, Johnny was taken out. He cast a look back over his shoulder at the frosty pair. Olaf remained at the table idly fingering the cards.

The girl turned a cold glance over her bare shoulder. "Now it starts," she said cuttingly. "Leaving us alone here! You touch me and I'll scratch your eyes out."

Olaf was nettled. "From what I've seen so far," he retorted, "I'd rather touch a rattlesnake."

"Keep right on thinking that," she warned.

He could have told her that it was no plan of his but remained silent in displeasure.

She swung about slowly and with hands on the sill behind her, looked him up and down critically. He flushed under the cool insolence of her glance.

"You look like a pretty husky specimen," she told him in her scornful manner. "What are you letting a lot of weak old men keep you tied up here for? Why don't you be a man and clear out?"

Olaf frowned. "I hadn't decided I wanted to clear out," he responded impatiently. "I'm ignorant as an animal. Terkov even called me an idiot. I've learned a lot from Johnny, and I can

learn a lot more. 'I didn't want to go on being a savage.'"

"Hm-m-m! It suits me," she retorted. "No crazy old men are going to experiment on me. They'll have their hands full keeping me here. If I had had a little more of your size, they wouldn't have gotten me in the first place."

Olaf didn't know what to say for a moment. "I can't fight a lot of old men," he replied sullenly. "It would be like killing babies."

"I'll not have any such objections," she said threateningly. "I can handle at least three or four of them. There's more than one black eye out there already."

He regarded her thoughtfully. Her sturdy, woods-trained build looked quite capable.

"Did you ever hear of a neuroblast?" he inquired bluntly.

"You mean that thing outside?"

"They stand off where you can't get at them and shoot you down," he told her. "It knocks you out cold."

Privately, he was wishing she would start something. If they gave her the neuroblast a couple of times, the weapon would be empty. It wouldn't hurt her and might take some of the spunk out of her. He decided that he didn't like her at all.

She turned to the window again.

"It might be all right if it wasn't for Terkov," he said. "And he may give up his experiments now."

She turned on him with blazing eyes.

Gissing had been listening with interest. He stole off up the path to report to Terkov.

"It doesn't work," he said doubtfully, entering the laboratory where the other was engaged. "They take to each other like a pair of strange bulldogs. They're having a fight."

"Oh, let them be," responded the leader without interest. "Keep an eye

on them. Idleness, time and propinquity, you know. They're only human."

AT NOON Johnny came back. "I'm out of quarantine," he informed them, "but I'd much rather eat with you young folks."

Trevor brought a tray for three and they coaxed the girl to try her share. Olaf was doing full justice to his. Johnny had always regarded the youth's appetite with envy.

"Wish I could eat like that again," he said wistfully. "I haven't had an appetite in years. You don't know how sick we are of that man's cooking, after all these years. He had some talent for it at first, then he came to hate it. We took turns for a while, but that was worse."

The girl pushed her plate away, surveying Johnny with cool eyes.

The old man was still hungry for congenial companionship. "Miss . . . er . . . I don't know your name—" he began.

"Lola," she told him absently.

"Well, Miss Lola," he went on, "I want you to know that I have nothing to do with this scheme. Rest assured, if Terkov tries anything the least bit dangerous, I'll do everything in my power to help you escape. Too many things have backfired on us. I'm not in favor of any more. You two could get along somewhere else."

"We two!" she scoffed.

"Why . . . er . . . naturally," responded the old man a little puzzled and confused. Olaf tried to warn him with a glance. "You two are the only pair left in the world capable of . . . of—" he paused at the irate glance she turned upon him.

"I'm not having any," she said vehemently. "This Father of the Race, this Patriarch of Future Generations, will have to find someone else."

The old man regarded her helplessly. Olaf pushed back his chair and got to

his feet frowningly. He went to the window and scowled at nothing. The three of them were strangely quiet when Trevor came back for the tray.

"Who cooked this putrid mess?" the girl demanded, motioning to the food left on her plate.

Trevor bridled. "I did," he said shortly.

"If I couldn't cook any better than that, I'd go make a hole in the river," she told him acridly.

Trevor surveyed her a moment with a thoughtful look and went out without comment.

Johnny felt constrained and soon left.

"I don't believe they locked that outer door," the girl remarked.

In sudden interest, Olaf left the room and tried the door. It was locked. At a sudden bang behind him, he turned and surveyed the closed door between them. She was looking through the bars. She had taken the key to the inner side and twisted it spitefully in the lock.

"You stay out there," she told him.

THE AFTERNOON dragged away slowly. The girl stretched out on the cot and had nothing to say. Apparently she forgot his existence. He didn't care to disturb her. Lounging by the window, he tried to think of some way of overcoming the strange weapons with which she was menaced. It was like groping in the dark. Gissing still kept his distance.

Toward evening men came and got the girl. There had been a parley of some kind. Olaf heard them remark something about chancing the quarantine. He watched them go off up the path and then eyed Gissing sourly where the latter sat with his back against a tree, reading a book, the neuroblast across his knees.

"Evidently it pays to know how to cook," he remarked.

Gissing glanced at him and nodded. "Perhaps we'll have good food again,"

he said hopefully. "I haven't had a decent meal in sixty-five years."

Olaf wandered to the cot and took a nap. He missed the sudden flutter of excitement about the other building, the shouts and pattering of feet that drew Gissing away for a while.

But when Trevor came with the evening tray, Olaf surveyed his meal skeptically. He was disappointed.

"I don't see any improvement," he said to Trevor, noting vaguely that the latter had acquired a large bruise over the right eye.

"There isn't any," responded the other, in ill humor. "She only used it for an excuse. A few minutes ago she knocked me out with a potato masher and jumped out the window. The others are off after her."

Olaf sprang to his feet so suddenly that Trevor had no chance to escape. The door was always left unlocked while the tray was brought in. Seizing the old man despite his struggles, Olaf pinioned his arms with one hand and locked the other elbow about the man's neck. Trevor let out shriek after shriek as he was lifted bodily in the air and carried to the door.

Gissing came running back. With a curse, he aimed the weapon. Olaf swung Trevor in front of him as a shield just as the neuroblast hissed. He staggered with a queer feeling running over him for evidently some of the force had penetrated Trevor's body. The latter had gone limp. Olaf staggered as he supported the man's dead weight with one arm.

"Drop that gun," he rasped, "or I'll break Trevor's neck."

He had already sensed that these last few old men had a reverence for the remnant of human life. It was the reason for their patience with Terkov. They hesitated to work harm on each other and had long ago placed their individual dislikes in the strait-jacket of iron restraint toward each other.

Gissing dropped the weapon. He was at a loss as Olaf backed toward the villa still keeping Trevor clutched in front of him.

"Mind you don't follow me," Olaf warned, "or Trevor will pay for it."

Gissing was soon lost in the darkness.

Once inside the villa, Olaf dropped the unconscious man and ran for the laboratory. He encountered no one on the way, but Anders was sitting at the receiver with a radio helmet on his head. Olaf entered with bare feet as silent as a stalking leopard. He heard Gissing begin to shout.

Glancing around quickly, he located a heavy stone pestle. With a long bound, he clipped Anders on the side of the head and, as the latter fell over sideways, Olaf attacked the machine in a fury. The stone weapon reduced the plate to fragments.

Evidently not all of the men were in pursuit of the girl. He heard other shouts and the sound of running feet. Leaping to the cabinet, he selected the largest knife in the tray. He leaped through a window just as Terkov and two others came through the door.

Mindful of the neuroblast, he dodged around the front corner of the building. The cedars were heavy on the side toward Avalon and he sprinted for cover. Johnny had said the neuroblast was a short-range weapon, and it was too dark for them to see. He plunged on into the grove, satisfied that he was beyond their reach.

Skirting through the woods toward Avalon, he made a circle and came back to the river. With a burst of speed, he crossed an open meadow with wary eyes seeking signs of the searching party.

Now where would the girl go? Downstream, he decided. She had doubtless been told enough about the plague to keep her out of Avalon and the cemetery. She could go neither east nor west. It had been daylight when she had made

the break and, not understanding the neuroblast, she would probably not chance the open valley to the north. There was plenty of thick woods to the south and, if she had any sense, she would hunt cover at once.

Olaf realized that she must have had plenty of native wit and guile. She would be as elusive as a wild animal. She could probably run like a deer and had been going fast ever since, intending never to return. In open meadows and fields along the stream, he could run at top speed despite the darkness, but when he at length came to dense, heavy forest, he had to slow down.

There was no sign of the men. He didn't know how much head start the girl and her pursuers might have. Given any kind of luck, she could keep well ahead until she wore them out, in spite of their mechanical advantages.

But it began to look like a hopeless task. Had it been day he could have picked up her tracks. As it was, he knew she would run for a time and then use all her ingenuity to baffle pursuit on the morrow. He finally paused and told himself that he was a fool.

She would never keep to a straight course long and had doubtless turned aside before now. He had probably overshoot her tracks and would have to hang about until daylight and then go back toward the villa to pick them up. It was a great waste of time.

But he continued doggedly for some time. They had taken her weapons as they had his, and she was defenseless. The night already resembled to the cries of prowling beasts. A lion roared not far away.

"Damn them!" he gritted, for he knew it was useless to call out. They had made her hate him and answering was the last thing she would do. It would also reveal his pursuit. He walked on quietly, listening intently for sounds ahead, but telling himself it was a futile task.

Hunting for a girl who did not want to be found in this trackless forest, was much worse than hunting for a needle in a haystack. A needle at least could not run.

He stopped and looked about for a good tree in which to spend the night.

Just then a piercing scream came from not far ahead.

Plunging on blindly, he sought the source of the sound, knowing that she was in trouble. He slipped the long keen knife from his belt as he hurdled a fallen log. It was a most satisfactory weapon, of its kind, for the surgical blade was razor sharp.

A moon was rising in the east, obscured as yet by haze, but its feeble light showed him a small clearing ahead.

"Iola!" he shouted.

But there was no answer.

VIII.

CASTING about furiously, he made out a dim heap on the ground ahead. He heard an agonized whimper from the girl. Two dull orbs turned toward him, and there came the ominous throaty growl of a leopard.

With a bound, he was on top of the heap. Twisting about as he landed, he avoided a murderous sweep of the beast's paw. Next instant he had the leopard by the scruff of the neck and, jerking its head back at a sharp angle, he struck savagely with the keen-edged surgical blade.

There was a blast of hot breath in his face as the brute roared. Claws raked his ribs and shoulder. The first blow had evidently gone home, for the leopard was convulsed and its flaring claws beat the empty air. After a dozen lightning blows, he felt the slinky form relax in his grip. Dragging the carcass away he picked up the unconscious girl.

He found the stream nearby and splashed water over her inert form on the

bank. After a bit she revived. He sat down beside her, puffing with exertion and anxiety.

"Are you all right?" he queried.

She sat up gingerly. "Ouch! I've got a few scratches," she replied. She bathed an arm silently in the stream and then glanced toward him. The rising moon was nearing the treetops and some of its light reached them.

"I thought it was you behind me," she remarked. "No one else could have overhauled me that fast."

"I was lucky," he answered.

"What happened to the leopard?"

"He's dead."

"The darned thing dropped on me from a tree when I stopped to listen," she said.

There was a moment of strained silence. He felt self-conscious.

"What did you do, scare him to death?" she continued in her scoffing manner.

"I have a knife," he responded shortly.

"Well, you're quite a man after all," she drawled. "I didn't expect so much. I thought you were something they led around by the nose."

"This is a life I understand," he returned, beginning to feel impatient with her again. "I may be a chump about machinery and such, but there's not much around here I don't know."

"Hm-m-m. Let me look at you," she murmured. "You can't tackle a leopard and get off without a scratch."

"Don't bother about me," he answered. "The main thing is what do we do now? I'm not going back there. I wanted to learn things, but from what I've seen so far, I don't care for that kind of knowledge. You haven't any weapons so you can't stay here. I smashed their machine, but they're liable to stumble on us somehow. They're looking for you."

She paid no attention. Moonlight, pale but sufficient, was creeping down to the

water. "You've just torn a leopard to pieces with your bare hands, and I don't want you bleeding to death on me," she insisted. "You might be handy to have around again sometime."

"Stop joking," he said angrily. "Look here, I know you don't like me, but it will be safer to go on together tonight. Tomorrow we'll make bows and arrows and then you can do as you please."

She was inspecting his shoulder critically. The leopard had made one good swipe in its death throes. "Stoop down here by the water," she directed. "We've got to do something about that. You're bleeding."

"It will stop," he responded. "They're somewhere in the neighborhood with those radio things. We've got to go on."

"Not until I've done what I can," she objected. "Will you stoop down here, or shall I go borrow a neuroblast?"

"Oh, well," he shrugged resignedly.

As the moonlight deepened with the orb soaring high, she bathed the deep gashes the flailing claws had made.

"You're an unmanageable wretch," she murmured.

"I know quite well what you think of me," he retorted. "You've told me plainly enough. And for my part, I think you're a nasty, spiteful, bad-tempered husky. I'd as soon play with the leopard. You're quite capable of scratching my eyes out, as you promised. But if you try anything like that I'll spank the hide off you."

He missed the little smile that flickered over her face for she had her back to the moon.

"I'm glad we've got that settled," she muttered.

IN SPITE of their bravado, each knew that sleep would be impossible with such wounds. They were glad to relax on the bank and rest awhile. The night was young and there would be plenty of time to travel.

A lion roared again not far away.

Olaf sighed. "I guess I like this life best after all," he mused. "Now take that fellow, for instance. He's a nice understandable sort. You know he'll try to eat you, if he's hungry, and he'll let you alone if he's not. With my weapons back, I'd feel on even terms. He hasn't any infernal machines to knock you out before he goes to work on you."

"That beast must have cuffed me on the head," she remarked. "My ears ring."

"That's funny," he returned. "My ears itch."

"So do mine."

They considered the feeling a few minutes in silence. It grew more pronounced.

"I wonder what it can be?" she said. "Do you suppose we've caught something? It might be a symptom."

"I don't understand diseases," he replied. "My grandfather was a ship captain. He had been in the tropics. He said he used to take quinine for fever and his head always buzzed. I don't know whether it was the quinine or the fever."

She placed a hand on his forehead. "You haven't any fever, and we haven't had any quinine," she said.

After a few moments, the sensation had grown highly unpleasant.

"There seems to be a vibration in the air," he observed.

"What did you say?"

He repeated.

"Is there something wrong with your voice, too?" she queried. "I can hardly hear you."

He was conscious that her voice sounded far away. Soon some intense vibration was literally shaking them inside and out. Their brains seemed to rattle in their skulls. Frightened; they looked at each other aghast. They tried to leap to their feet, but staggered drunkenly and nearly fell in the effort. The tickling sensation was horrible.

"Oh, it's terrible," she cried. "I can't stand it." She placed both hands over her ears. Then she reeled.

Olaf tried to shout at her, but no sound came. He stared stupidly when he saw her mouth opening and closing in utter silence. She was trying to say something. Suddenly she lost her balance and fell over sidewise. She remained flat on her face, hands over ears, and he could see she was suffering.

He glanced frowningly at the running water and the black forest roundabout. There should have been plenty of sounds. But not the slightest noise came to his ears. Everything was dead, utter silence. He picked up a stone and crashed it down a few feet away. He felt a splash from the oozy bank, but not a sound resulted.

Staggering dizzily, he tried to think. What was this thing that had come over them? For a moment there was a twinge of superstitious doubt. It was just as if some malignant spirit had cast the spell of silence over them.

Then a movement down the stream caught his eye. His eyes were still normal, and he saw dark creeping forms. He understood most of it at once. How they had tracked him down and deafened him to their approach, he did not know, but somehow the men were responsible.

He tried to get the girl to her feet and urge her to run. She tried, but was almost helpless. A rage welled up in him at sight of her futile efforts. Then he saw Terkov, in some sort of queer helmet, step into a patch of moonlight only a few yards away. Seizing the knife from his belt, Olaf tried to make a bound forward. Things had gone entirely too far, this time, he raged to himself. But he reeled drunkenly and went sidewise instead of forward.

It was maddening. He was in full possession of his wits and could not keep upright. He crashed heavily and struggled to his feet on rubber legs. Terkov

saw the knife flash in the moonlight. Realizing the murderous rage confronting him, he raised his right hand.

Olaf sobbed, in baffled rage as his legs continued to play tricks. He made a few steps toward the men. He knew Terkov had some sort of a weapon. It was a short thick instrument, much like one of the ancient automatics, but very heavy. It had a large reflector of some kind on the front end. Terkov's head disappeared as he raised the weapon and sighted.

Olaf made a last desperate attempt.

There was a sudden terrific, blinding flash. Olaf came to a halt as though he had struck a stone wall. Darkness, complete and awful, had shut down on him. He raised his hands to his eyes. The moon was gone. He might have been shrouded in thick folds of black velvet. The dead silence continued. He wondered what had happened to the girl.

Then the knife was struck from his hands. He groped blindly when he felt hands about him, but he was expertly tripped and thrown on his face. He tried to fight back. Several of them were sitting on him. They had his hands now. Fear generated a sudden fury of resistance. Something hit him smartly on the head and he was dazed.

They soon had his hands tied. And not until then did he remember Johnny's story of millions of deafened, blinded soldiers unfitted for war.

IT WAS much later when he awoke from a fitful sleep. They had been led back to prison in their helpless state. A cot had been fetched for the girl. Olaf had drifted off after hours of worry in dead, black silence. The blackness continued for he had a bandage over his eyes. They had bandaged the wounds he had received from the guard. But as he moved, now, he heard the creak of a wooden cot. He could hear the mill and slight noises from the grove outside.

"Is anyone here?" he asked and was gratified to hear the sound of his own voice again.

"I'm here," said Johnny's voice from somewhere.

"For God's sake what have those devils done to us?" raged Olaf.

"They turned a resonator on you from here," responded the old man. "I told you we had lots of things like that left over from the war. It is only a small one because we haven't much power, and they didn't turn it on very strong. Just wanted to deafen you temporarily, while they sneaked up on you. We had large ones during the war that would tear a man to pieces if he got the full force."

"You're a lot of fiends," declared Olaf bitterly.

There was a sound of sobbing from somewhere. "But we're blind," came Lola's voice.

"No, you're not," replied Johnny soothingly. "Terkov didn't give you much. It'll pass off. The flash works on the principle of snow-blindness. Contracts and paralyzes the iris of the pupil. You only got a small flash so the iris will gradually relax. You should be all right by tomorrow."

"You damned maniacs," shouted Olaf. "I thought you were different. How can you talk so calmly about it?"

"They may have us tuned in," warned Johnny.

"Oh, I see."

"Don't know as I blame Terkov," the old man continued. "He said you had a knife and were coming for him."

"I was," admitted the youth. "But I couldn't stand up."

"The resonator destroys your sense of balance, located in the eardrums," explained Johnny.

Olaf fumed. "What can you do against people like that?" he raged.

"Nothing," responded the other philosophically. "After all, those weapons were developed when about twenty million here in the Avalaine were fighting

three and a half billion. We had to be merciless."

"But how did they find us so easily? I thought I smashed the receiver."

"You only smashed the glass," returned Johnny with a chuckle. "Left all the vital parts intact. They could calculate where you were well enough."

Lola had ceased sobbing at Johnny's assurance. Olaf felt better, but talking eased the leaden weight of impenetrable darkness. "Do you think they're listening in?" he asked.

"I wouldn't be surprised," responded the old man. "They'll want to know when you're cooking up something like that again. But come here, both of you."

Olaf arose and went toward the sound. He found Johnny's hand and, at a touch on the other side, found the girl. He felt for her hand, seized it, and gave a warning grip which he maintained.

"Get your heads close together," directed Johnny. "The machine can't be accurately tuned at this short distance and three heads create interference." When they had their heads pressed together, he added: "Now don't you two worry. I'm trying to think of a plan. You see how useless your own efforts are. It will have to be strategy."

"Can't you do something to that infernal thing?" demanded Olaf angrily. "It's not decent to have no privacy like this. They pick our very brains like burglars at a safe."

"I might disconnect a wire or two," replied Johnny indulgently. "They might not discover it for a while."

"Go ahead," urged Olaf. "They're going to drive me as batty as Terkov."

"Well, I'll see."

As Johnny turned to go, Olaf asked, "Is anyone else here?"

"No. They know you can't get away now. I think they're all going to bed. It was quite a strenuous chase for old men."

Olaf kept tight hold of the girl's hand

as Johnny went out. He drew the girl to him and pressed his head tight against hers.

"I've got to chance the machine," he said quickly. "Think hard about something. Now listen. If you feel your sight returning, I want you to pretend to be blind. Don't let on that you can see until I tell you. Now think something else."

"Isn't it a lovely day?" replied Lola. "Do you think it will rain?"

IX.

THREE MEALS had come and gone, during a dreary day, and so they knew it was night again. Johnny had delegated himself as nurse to keep them company. Olaf removed the bandages and the old man held his globe over the cot. The youth looked here and there blankly.

"No, not yet," he said. "I can't see a thing."

"Maybe it's a little too soon," agreed Johnny. "But keep the bandages on. The irises retract faster in the dark."

When Johnny left for the night, Olaf rose from the cot.

"Can you see?" queried Lola in a whisper.

"Enough for the purpose," he responded. They knew that Gissing was not back on duty. Olaf took up the globe, which he saw as a dull-gray spot, and went to the other room. He placed a chair on top of the table, beneath a trap-door he had previously noticed in the ceiling. Mounting, he forced the door with some difficulty and pulled himself through.

The upper story was black, although the moon was coming through a small window to the east. The vanes kept up their constant creaking and, inside the room, a long beam moved steadily up and down. He found it and located several gears below it by sound. He could see the generator because of the bright flash-

ing of sparks in its brushes. After studying it a moment, he went to the walls.

Wide cracks between the logs let in drafts of air. After feeling about the floor, he located a coating of thick gritty dust. With a good handful, he returned to the generator and carefully sifted it into brushes and bearings. There was a grinding noise and a strong smell of burning iron. Little flames flickered up as the machine grew hot. He jumped back as one of the bearings burst and the generator tore itself to pieces.

He climbed down again with satisfaction.

"You can think as you want to," he told the girl. "I've spiked most of their guns. Their devilish inventions depend upon electricity. They'll not be so lucky next time we make a break."

A short time later, Terkov and three others appeared at the door. The pair were released from their barred prison, and, still with the bandages on so that they stumbled frequently, they were conducted to the villa.

"What is this?" asked Olaf as they were led into new quarters.

"One of our best rooms," responded Terkov. "We've fixed it up with the best we have."

"Oh, the bridal suite?" Iola was still scornful.

"And, if you attempt to escape again," added Terkov with sinister intentness, "you will be blinded and deafened permanently so that it will be utterly impossible thereafter. We hope you will not make it necessary."

"Evidently we have no choice in the matter," remarked Olaf bitterly.

"Certainly not," retorted the leader. "The future of the race is not at the mercy of your personal whims."

When he had stalked out and locked the door, Olaf removed the bandages. A globe illumined the room which was fairly well furnished. There was but the one door. He surveyed the windows intently.

"Not so bad," he mused. "They think we are still blind. I think I can work the catches on those windows. There is heavy glass here, instead of bars. The resonator and receiver are out of commission. The neuroblast has but one charge left. If I can slip out and locate that flash thing, we'll be nearly safe."

"Can't we try it now?" the girl asked anxiously. "They'll know we're not blind soon, and then they'll have a guard at the window again. It may be our last chance."

"It's not even half a chance," objected Olaf. "The leopard nearly got you as it was. What would we do out there with you still blind and me nearly so, neither with any weapons? I've got to locate our weapons first and smash theirs."

"That fiend, Terkov," hissed the girl. "He's capable of blinding and deafening us to keep us cooped up here like a pair of breeding organisms."

"Like the what-is-it in a glass case," agreed Olaf. "It had no senses, either. He said it was the concentrated essence of sex. If I ever get a good chance, I've a notion to stretch his neck out a foot long."

"It's going to be horrible."

"It all depends on that window," Olaf decided. "But we've got to have more privacy. I think we should pretend to fall in with their plans. If they think everything is working out nicely, they may get careless. They may not even post a guard."

"All right . . . for the good of the cause," she replied. "But remember, I've got my fingers crossed."

OLAF WENT to the window. He could see well enough to inspect the catch. There appeared to be no difficulty. Opening the window, he leaned out to stuff the air. After several minutes, he decided that there was no one about. He slipped out and crouched in the shrubbery awhile. When nothing

happened he stole off toward the laboratory, using all of his trained woods sense and stealth.

Terkov was there alone. From some distance away, Olaf surveyed the interior wondering where they would keep the flash gun. He could see it nowhere about, but knew that his sight was not yet normal. Most things were still in inky shadow. The narrowing of his pupils had caused the brightest lights to focus in such hard sharpness that they hurt his eyes.

He made a cautious circuit of the building, not knowing where any of the men slept. The neuroblast was so constantly in Gissing's company that he decided to try and find where the man was. The weapons might be kept together and Gissing might be the clue.

At some risk, he peered in several dark windows. Taking a chance on one, with the dim oblong of an open door beyond, he slipped over the sill. Almost instantly there was a flash of light. He had stumbled upon Gissing by chance. The latter had been sleeping in this very room with his globe covered by a tight hood. As Olaf saw the man's face materialize out of the darkness, he knew he had erred.

He plunged forward swiftly at sight of the neuroblast.

Iola was waiting in breathless impatience. Finally there were sounds of feet in the hall. She glanced around desperately wondering how to call Olaf back and prevent the deception being discovered. But the door opened and four of them came in carrying Olaf, who was unconscious. They laid him on a couch and went out. After a while, he recovered and felt of a bump on his head with disgust.

"What have they done to you now?" queried the girl.

Olaf was downhearted. "Shucks," he responded. "I stumbled on Gissing by accident. I rushed him to make him shoot me with the last charge in the

gun. But he fooled me. He clipped me on the head with it."

Terkov came storming in with others on his heels. With Gissing and the neuroblast standing guard, they forced Olaf down on the cot while Terkov made a swift examination. Holding his globe close, he pushed back Olaf's lids and peered at the irises.

"Pupils already retracting," he said savagely. "I warned you. Now you have just one more chance. Don't play any more tricks like that. You can't fool us forever, and if you continue to cause trouble we'll have to assure ourselves that you can't."

When they had gone, Olaf sat for hours in gloomy thought.

"Well, that chance is gone," he said glumly, knowing that the door was locked and Gissing was posted once more outside the window. "I don't know what to do, short of murder. I suppose I could catch Terkov off guard long enough to wring his neck. But the others would get me."

"We'll think of something," the girl said to cheer him up. "We've got to."

"It better be good," he replied grimly.

NEXT MORNING Johnny drifted in, as companionable as ever. They were allowed to have the window open, but Anders, with the weapon, was sitting a few feet away.

"They've discovered the wires I disconnected," whispered the old man, "but something has gone wrong with the receiver. They're working on it."

Olaf started. In that case they would soon be tracing down the trouble. No telling what complications might ensue at Terkov's rage over the ruined generator.

Johnny was delighted to find the pair sitting close together apparently on terms of friendship at last. He beamed and rubbed his hands together complacently.

"You know, it's not bad here," he said. "Used to be a park. This was

the clubhouse. I think you're going to like it. It's comfortable, and we've felt safe. There's never been any evidence of the plague."

Olaf desired to keep Johnny talking for he often let slip things of value.

"I still don't understand some things," mused the youth. "You said one time that medical science was able to cope with the plagues in Avalon and that they never became serious. What killed everybody?"

"Measles," responded Johnny soberly. "The one thing we couldn't foresee and didn't expect. We didn't know what it

was when they struck us. We thought the measles were extinct."

"What are measles?" asked Iola.

"*Tsk, tsk, tsk,*" Johnny clucked with a queer helplessness as though his task as instructor had turned out to be more than he could cope with. He explained the disease to the girl.

"You have no idea how awful things were," he told them. "The lucky ones are out there in Elysium. They got buried. There was no one to bury the last ones. They had to lie wherever they passed out. Avalon is full of bones. That's why the plague is as



"It doesn't do any good," he said gloomily. "We've got the plague . . . and that means a few hours to live."

deadly today as ever."

"Are the measles so deadly?" asked the girl.

"It is now," the old man returned forcefully. "You see, the human constitution has the power to wear down disease organisms in time and create immunity. In ancient days the measles were a terrible scourge that wiped out populations wholesale. By the beginning of the twentieth century, it was only a mild disease. By the middle of the century, it was stamped out."

Otaf's forehead puckered. "How did they get here?" he asked.

"*Tsk, tsk, tsk.* The war. I told you about the war," responded Johnny. "We hadn't all the scientific brains in the world. We were winning out, but our enemies were more ruthless than we were. They experimented with those germs and even improved on them."

"Projectiles, rockets or ships couldn't get through our neutrality zones and the infrared barrage, so they shot rockets loaded with measles cultures into the zenith. They had only to calculate how high to shoot them and the turning of the Earth on its axis brought them down here in the Avalaine."

"They went up under power charges, but they came down by gravity. We had no defense against projectiles falling silently from the zenith. About forty landed before we knew what was going on. They burst high in the air and flung canisters far and wide, which burst in turn with a light charge near the ground. The germ cultures were in bright-colored little capsules that attracted the eyes of children. They played with them and broke them open to see what was inside."

"By that time commerce was dead. We had cut ourselves off from the source of medical supplies. We were out of everything, too. The measles spread like wildfire and there was nothing we could do. In three years Avalon was an empty city. Out of ten million there were only about

twelve hundred left. The others have died off since in the ordinary way or from the occasional outbreaks of the plague. It breaks out every so often. We hadn't had measles for a century, and immunity was gone."

"Horrible," said Lola and went to the window.

"But if there were people left to shoot at you," said Otaf, "there may be some there yet."

"Oh, no," responded Johnny positively. "We calculated where those rockets were coming from—it was the last remnant of the Mongol Empire in the interior of China. We turned a hundred and fifty rockets into the zenith, loaded with a thousand pounds of dynamite in each. When that hundred and fifty thousand pounds landed, there was no more Mongol Empire."

"You can still see cracks in some of the buildings in Avalon from that shock. It caused earthquakes all over the world. Tidal waves. Cyclones and various atmospheric disturbances. Even here on this side. For a while we thought the Earth had turned over, for we had nearly a week of almost total darkness. The finer dust went so high that, as the Earth turned on its axis, that dust cloud was wound seven or eight times round the globe."

Lola was apparently trying not to listen. One hand in straying idly about had found a bit of shrubbery. She was toying with it. Anders, outside, glanced at the leaves in her hand.

"Don't touch that," he said curtly. "It's poison ivy."

The girl drew back her hand as if stung.

Otaf was still probing for deadly secrets. "Have they any more of those infernal machines?" he asked. "Things we haven't seen yet?"

But Johnny shook his head.

"I guess you've had the works," he answered.

X.

OLAF AWOKE after a brief uneasy sleep troubled by nightmares. There was a queer sound in the room. He glanced over at the other cot. Iola was tossing restlessly, and groaning. Thinking of the dreams that had tortured his own slumbers, he lay a few moments undecided.

"Iola," he said to waken her.

She did not respond.

Getting up, he took the globe and held it over the cot. It was not yet quite daylight outside. He saw that her eyes were closed, but her lips were moving as though she were trying to talk. He shook her and then stood back at a loss. Speaking to her had no effect, either. She looked ill. A closer inspection showed some little red blisters on her face. As she moaned again, he realized that she was suffering.

Rushing across the room, he pounded on the locked door.

"Johnny! Terkov!" he shouted.

He continued to pound and shout and then lifted a chair which he crashed against the door. He continued until he heard steps outside.

"What's the matter in there?" demanded Gissing's angry tones.

"Iola's sick," he shouted. "I can't wake her."

Gissing opened the door and came in. He took one look at the girl and fled in panic. In a few moments there were excited voices and the sound of bare running feet.

Terkov appeared and, after a suspicious glance about the room, approached the girl. Johnny hung in the doorway. Others were behind him, watching in alarm. None of them said anything. The leader needed no more than a glance. He started back from the cot with face twitching.

"Gissing is right," he stammered. "It's the plague again."

As Olaf took a step forward, Terkov

whirled upon him with hands upraised. "Stay away!" he cried hysterically. Skirting around the youth, he headed for the door. "The rest of you get out," he told them.

As the others left in haste, Terkov paused with hand on knob. "Have you ever had the measles?" he demanded of Olaf. As the latter shook his head, Terkov went on: "Well, we can't chance it. The girl was evidently infected when she arrived. You've been exposed. You'll have to stay here."

And whipping through the door, he slammed and locked it behind him. Olaf paced about the room uneasily. Daylight was fast growing. Iola was quieter. What to do about such a situation, he knew not. After a while there was a timid knock on the door and Johnny thrust a hand through the opening with a glass of some amber fluid.

"Give her this," the old man directed. And, as soon as Olaf had taken the glass, the door was shut and locked again.

Olaf raised the girl's head and held the glass to her lips. It revived her.

"I don't remember asking for a drink," she told him tartly. "Oh, I've a headache. I'm dizzy," she ejaculated as she tried to sit up.

He set the glass down on the table and regarded her with troubled eyes. Going to the window, he watched the sunrise with a frown.

"What's the matter, and why are you pouring things down me?" she queried. Rising unsteadily, she came toward him. A glance out the window showed her nothing of interest that he could be mourning at save Gissing, who had taken up a belligerent posture beyond the window, legs wide apart, weapon uncompromisingly clutched in both hands. He was frowning.

"You two look like you've been making faces at each other," she remarked.

"You'd better lie down," he replied, gently.

"But I just got up," she objected.

"What's going on here, anyway?"

He did not know what to tell her.

"Are there mosquitoes around here?" she asked.

He looked at her in perplexity.

"You're some red spots on your face," she explained.

He stared at her in alarm. Stepping quickly to a mirror, he peered earnestly at his reflection. She was right. There were a few small, watery, red pustules.

SOME TIME later, the door opened abruptly. "Come out here," directed Gissing roughly, keeping the neuroblast pointed at them steadily. Both did as he requested, wondering what it was all about. He kept well behind them, but urged them on toward the laboratory at a fast pace. There they found all the old men collected. A meeting of some kind was in progress. They had been arguing something and one or two were angry.

Gissing shepherded the pair to a position at one side and remained guarding them alertly while he glanced at Terkov who stood alone facing the group.

"Long ago we discussed this situation and came to a decision," began the latter. "But since that time another matter has come up. The choice at this time is of such importance that it behooves us to think clearly."

"Get on with it," put in Gissing sourly. "Every minute counts."

"A vote has been taken," continued Terkov, unruffled. "We seem to be about evenly divided. I have not yet cast my vote. It may be a deciding vote, and it may be a tie. In the latter case nothing will have been gained and so it is important that we consider this matter from all sides—in case anyone wishes to change his mind."

"Quit making speeches," interrupted Trevor impatiently. "I tell you, we'll have to split up and scatter for a time. The survivors, if any, can get together

somewhere else later."

"That is one point of view," agreed Terkov. "On the other hand, there is our decision of years ago. At that time we decided that if the plague were to break out again, the sternest remedies would be necessary. In the lack of all medical facilities it were better to sacrifice the victim than to endanger the group."

"There are five to go (and six to remain)," he told them. "That makes mine the deciding vote. And I say REMAIN! That makes it seven to five. The victims must be eliminated."

"The decision has been reached and the course agreed upon," continued Terkov coldly. "In the interests of the group, any victim of the plague must die."

Olaf glanced at Johnny and found no help. The latter was eyeing Terkov steadily.

"Let's get it over, then," muttered Trevor.

They shifted their feet uneasily.

"But, Mr. Terkov," said the girl. "What are those red spots on your face?"

Gissing whirled as though prodded by a point. He took a quick step toward the leader and scrutinized the latter sharply. Terkov's black eyes widened as he stared at the girl aghast. A hand fluttered to his temple.

"Why . . . why—" he stammered, and cast a quick look of fear at those about him.

"She's right, Terkov," Gissing said savagely. "You've got it, too. That makes three. It was you forced this decision."

Terkov seemed to deflate like a punctured balloon. Into his eyes crept a look of horror. His face twitched. He seemed as yet unable to grasp the full import of the situation. Then he let out a sudden shriek and with a bound, had wrested the weapon from Gissing's hands. He swung it on the group.

"Keep back!" he screamed, the light of madness in his eyes again. "I'm not going to die. You can't kill me!"

Olaf pushed the girl behind him. He whirled and struck swiftly. As Trevor went crashing over a table, the youth darted forward and swept up the flash gun. There was an outburst of excited cries. Gissing swore, but was helpless. Johnny pushed back his errant lock aimlessly.

Terkov turned upon the youth and aimed the neuroblast. There were shouts from the crowd. Gissing flung himself flat on the floor. Others crouched over with hands pressed tight to their eyes. With a sudden bound, Johnny was in front of Olaf.

"Run, you two. Get out!" he shrieked.

As Terkov pressed the trigger, the old man collapsed in a limp heap and fell face forward. Terkov saw that Olaf was untouched. With a baffled cry, he drew back his arms to hurl the heavy weapon.

There was a blinding flash.

Darkness shut down like a lid. The reflector shielded the eyes of the wielder and those behind it, but the walls had flung back a blinding glare. There was a confusion of shouts. Turmoil for a moment. Olaf sought for and found the hand of the girl.

As he headed for the door, he bumped figures in the darkness. He brushed them off. Terkov was screaming. He had caught the full blast.

While the men milled about with futile cries, Olaf stumbled to the window and helped the girl crawl through. They stepped out in hot, black sunshine. By mere instinct, they found the path past the mill.

The last thing they heard was Terkov's hysterical shouting. "Fools! Fools! I was the last hope of the world. And now it's gone. All gone!"

MILES AWAY, they slowed down to a comfortable walk.

AST-4

"Can you see all right, now?" asked Olaf.

"Fairly well," she responded. "Enough to keep going, anyway."

"What's the hurry?" he asked as she brushed by him and took the lead. "They aren't going to pursue the measles."

"I know. But the city is still in sight. Of all the places I never want to see again, this is tops."

He was moody as they continued. "I hope the flash didn't get the others," he said. "Especially Johnny. I didn't know how to work the thing. May have turned it on full blast."

"I can't sympathize with any of them," returned the girl. "They're responsible for all this."

"Not exactly," he objected as he followed her. "If science had been financed in the first place, scientists would have turned their discoveries to good and progressive ends. It was the promoters trying to grab everything who caused all the trouble."

"If it hadn't been for the scientists, the promoters wouldn't have gotten anywhere," she shrugged. "Let's keep going."

"What's the difference?" he asked. "We probably haven't long. From what I've heard, the plague works pretty fast. We might as well be one place as another. I feel sick."

"It's only your imagination," she told him.

He was silent for some time.

Finally: "I know you hate me," he said. "But do you mind if we stay together—uh—that long?"

"Are you sure you don't think I'm a nasty little spitzire with a bad temper?" she flung back over her shoulder. "Wouldn't you rather have a nice leopard?"

"I never did think that," he insisted. "You do get me riled. But, you see, I listened to you quite a bit before you showed up. I couldn't understand you at all after that."

"Do you think any girl would want a lot of crazy old men experimenting on her?" she demanded.

"I guess not."

She halted and swung about, bringing him to a stop. For a moment she surveyed him critically. "I don't hate you," she said calmly. "I thought at first you were part of that scheme. I know better now."

"Then you don't mind if we . . . if we stay together until . . . until—"

She stirred the soil with a bare toe and glanced up demurely. "You're taking on a large contract," she murmured. He saw there was a smile lurking behind her eyes.

"Don't joke about it," he said solemnly.

"Let's sit down on the little bank here," she suggested. "I guess we can afford a rest. Now, isn't this nice?"

He relaxed with a sigh. He cast a glance at the sun-dappled forest roundabout. She studied his gloomy countenance until the smile crept through again, and she burst into laughter. He turned a hurt glance upon her.

"How can you be like that?" he reproved her. "Here we are, free again. It's a wonderful world and a beautiful day. And it may be only a matter of hours."

"But, silly, we aren't going to die," she exclaimed.

He examined the spots that had ap-

peared on chest and shoulders. It itched terrifically, but he knew he shouldn't scratch it. He squirmed instead.

"Don't tell me this is imagination," he said severely.

"It'll itch like the deuce," she said, "but we'll get over it. Didn't you notice those red berries and the sprig of poison ivy outside our window? I got the idea as soon as Anders mentioned it. Your plan fell through, so something had to be done."

"So?" he queried frowningly.

"So I took some of the red berries and some of the ivy," she confessed. "The berries make the color and the ivy makes the little blisters. I've had a lot of experience with poison ivy. I crushed out the juice after you had gone to sleep. I sprinkled it on myself and put a little on you, too. It worked very well, don't you think?"

"But Terkon?" he exclaimed.

She was instantly sober and her eyes became grave.

"Oh," she murmured. "That may be the real thing. He went into Avalon, you know. I didn't put anything on him, but I don't think it's anything more than poison ivy. They've been around there, and going into Avalon for a long time, and I should think that anything—even measles—would die after a while. He went into the woods after us, you know, and the old fool's no woodsman. He probably blundered into poison ivy, too."

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THE OTHER SIDE OF ASTRONOMY

*Anecdote and incident on how to be
an astronomer and why not to be one.*

By R. S. Richardson

of Mt. Wilson Observatory

Cartoons by Urban

FOR some reason astronomers seem to interest the public more than any other type of scientist.

Just why they should have more glamour than a botanist or an ichthyologist has always been a mystery to me, but the fact remains, nevertheless. Astronomers themselves are generally ordinary enough individuals, quiet law-abiding citizens, interested in their homes and families, and the number of miles they get to the gallon of gasoline. An astronomer would be a good man to have for a neighbor.

What makes a person want to devote his life to the study of the stars? I don't know. A woman once lived next door to us who had the greatest enthusiasm for the embalming business. You are either born with a love for it or you aren't. In my own case, I can't remember a time when the starlit sky didn't fascinate me. I have asked other members of the profession about this and their answers are all pretty much alike. They went into it because they had an instinctive desire to explore other worlds than ours that couldn't be resisted.

The question of how you get started as an astronomer used to worry me a bit. If you wanted to sell insurance, or groceries, or secondhand cars, the answer was obvious enough. But you couldn't go up to an observatory, knock

on the door, and inquire if they needed another man. Finally I wrote to a dozen leading astronomers and asked them all about it: how do you begin, which field offers the most opportunities. All except one was encouraging. Astronomy was an excellent profession, there were many splendid opportunities for young men, by all means go into astrophysics.

The lone exception was Dr. Edwin B. Frost, formerly director at Yerkes, who became blind during the later years of his life. He said that, while he could not deny the delights of astronomy, at the same time it required at least eight years of preparatory training, and afterwards probably nothing better than a teaching position at low pay. Looking back, his words sound unduly pessimistic, but out of the twelve I think his advice was the most accurate statement of things as they are.

Students who desire to become professional stargazers start in by going to an institution with a strong astronomical department, such as Princeton, Harvard, or California. During their four years of post-graduate work they make the acquaintance of noted astronomers and visit the biggest observatories whenever possible. The high point of a graduate student's career is his thesis on some problem he has worked out by himself—usually one to which he knows the an-



swer already. His paper is carefully read by the members of his committee, and after being officially accepted, is filed away in the gloomy archives of the university's library, where the light of day seldom penetrates. After that he is perfectly free to look for a job wherever he thinks he can find one.

PRACTICALLY all the large observatories in this country are the gifts of wealthy men. An incredible number of multi-millionaires have left their fortunes to the advancement of a science almost devoid of practical benefits, sometimes to the consternation of friends and relatives. Perhaps after a hectic life in Wall Street their thoughts turn to the abstract and intangible. When Andrew Carnegie, whose money built the telescopes on Mount Wilson, was told they had revealed stars never recorded before, he replied that this alone justified their construction.

The Lick Observatory came about in a peculiar way. It was the result of a gift from Mr. James Lick, a wealthy Californian long noted for his eccentricities. The telescope is situated 4000 feet above sea level on Mount Hamilton overlooking San Francisco Bay in the distance. Why Mr. Lick chose to leave

his money in this way will always remain a mystery, for there is not the slightest evidence that he had ever looked through a telescope or had the least interest in the stars.

At first he had toyed with the notion of erecting a large number of statues of himself, the idea being that in centuries to come they would be prized as valuable relics, like the statues of ancient Greece and Rome. But later this was abandoned in favor of building the biggest telescope in the world. When confronted by estimates of the cost of such an instrument, however, his enthusiasm cooled considerably. The price of the equipment amazed him. In particular, he could not understand the necessity for so elaborate a mounting. Why not simply fasten the lens onto a long pole or high tower of some sort? While they were trying to straighten it out, Mr. Lick died, leaving the trustees free to go ahead with their plans. He has been peacefully sleeping under the pier of the 36-inch refractor for sixty-two years now, apparently well pleased with the way it all turned out.

People who fall into the error of thinking that because astronomy deals with the heavenly bodies, and that, therefore, astronomers must live on a

more exalted plane than other mortals, would have been disillusioned after about one day at Lick in the '90s. Although that was long ago it still remains the best example I know of the handicaps under which much of the best astronomical research has been—and to a lesser degree, still is—carried on in the United States.

ALL SUPPLIES to Mount Hamilton had to be hauled by stage twenty-six miles from the nearest town of San Jose. Provisions were ordered over a single precious telephone line, and if the order was forgotten, or the line broke, you simply went without. Fuel had always been a problem at Lick for the region is very sparsely wooded. One year they were reduced to picking it up along the road and delivering it in parcels like express packages. It was hopeless to try to keep the houses warm in winter; often they became so cold the

water froze on the dinner table. Many of the dwellings had defective flues, and when the wind blew from a certain direction, the flames shot several feet into the room filling it with soot and smoke. This often made it necessary to eat in the halls and bedrooms.

To add to the complications, the water supply occasionally ran low, forcing them to drink the same water that had been used to raise the floor under the 36-in. Since it has passed many times through the water engines and hydraulic rams, it was covered with a heavy film of oil, making it sickening stuff to drink. But it had to be drunk because there was nothing else available.

Another formidable problem was the matter of haircuts. Opportunities to visit San Jose were extremely rare, with the result that the astronomers had to be their own barbers. Those who became fairly expert at it often found their services much in demand. Fortunately this was long before the day of bobbed hair.

To carry on research under such conditions called for courage and resourcefulness of a high order. But they went steadily ahead. Barnard discovered Jupiter V, Burnham measured the position angles of double stars, and Keeler photographed the extra-galactic nebulae, despite the fact that there was no meat in the house for dinner, and the pipes had burst in the bathroom.

A serious disadvantage to the plan of both living and observing on the mountain, is the education of the children. Al-



though a schoolhouse was early provided on Mount Hamilton, the State will not furnish a teacher unless a certain minimum number of pupils are available. Which once led the observatory, in desperation, to advertise for a carpenter with five children. And the difficulty arises again when the children reach high-school age.

If the men who made history at Mount Hamilton could return today, they would find steamheat and electricity, and San Jose with moving pictures and beauty shops only a few hours away. But even with modern conveniences, life on an isolated mountain-top can be trying at times. Snow may block the road so that groceries have to be packed up by foot. And I distinctly recall as late as 1930, that it was always advisable to get a haircut on going to town.

AT Mount Wilson, on the other hand, the instruments are on the mountain 6,000 feet high, but the offices of the observatory and the astronomers' homes are in Pasadena, just below. Trips are made to the mountain only when the men wish to observe. A program is made out three weeks in advance, telling each man when he will have the exclusive use of the sixty or hundred-inch telescopes. Generally each astronomer devotes about ten days out of the month to observing. During this time he lives at a building provided by the observatory called the Monastery. How the name originated is unknown. One explanation is that it was because of three of the men who first lived there: Abbot, Monk, and St. John. Here the astronomers eat, sleep, and generally pass the time when not at work.

Life on Mount Wilson moves along smoothly in clear weather, but a prolonged cloudy spell can really get you down after a while. All the little faults in you and your fellow inmates come to the surface. Somebody's habit of al-

ways mispronouncing the same word, or the way he eats his pancakes. One of the best features of the Mount Wilson system of observing on the mountain and living in town, is that you never get to see too much of any one person. The faces around the dinner table are always changing. Some of the men take the gloomy weather good-naturedly, but others are not so philosophical. They may want to photograph a variable star at a particular phase of its light curve; or perhaps their stars are beginning to get away from them, vanishing into the dawn. In which case, they eagerly listen for the weather reports over the radio, and get hopeful if a patch of blue sky momentarily appears.

On rainy days I always think of the late Dr. Francis G. Pease, who was the first to measure the diameters of stars with the interferometer and worked with Michelson on the velocity of light. Clouds never seemed to bother him in the least. Hour after hour he would read by the roaring fire, while the fog drifted monotonously through the pine trees. He was very fond of pulp fiction and kept a stack of thrillers in his room at the Monastery. I know this sounds like logrolling, but I am sure his favorite was *The Shadow*. He never seemed to tire of following that elusive individual.

If you really want to get an astronomer at Mount Wilson launched on a speech, accompanied by gestures, just ask him how he thinks the visitors to the observatory should be handled. In the old days, when everything had to be packed up over a narrow trail by mules, strangers were seldom seen on the mountain. But now a high-gear road makes it an easy drive from the city, so that around 75,000 people come up every year, and the best way to look after them has developed into a real problem.

These people are naturally anxious to see everything and are disappointed and often angry when they find all except a

few of the buildings close to them. Ordinarily well-behaved men and women, no doubt highly respectable members of the community, seem to have no compunction whatever when it comes to breaking into an observatory.

I distinctly remember one old fellow who made an investigation of the suntower where I happened to be working. First he tried all the doors and then windows without success. After a few more attempts I heard him yell to someone: "Can't get in here either. This is the locked-uppest place I was ever at."

Friday night the sixty-inch reflector is turned over to the public, but it is hard to make many people understand why they can't come in and take a look any time. They fail utterly to realize that an astronomer's office hours are at night, and a delay of even half an hour may upset his program entirely.

Another frequent interruption is from

phone calls. You are working high up at the Newtonian focus of the 100-inch and the telephone rings. Well, let it ring—I'm busy. But then you get to thinking. It might be a telegram. Perhaps a member of the family has had an accident. So you climb down thirty feet in the dark and grope your way to the phone. Only to find that a cross-word puzzle addict wants to know the name of the 403rd asteroid. Or if it isn't that, it's where was the Moon last night, and what is the precise velocity of the Earth in its orbit. Those who believe the heavenly bodies exert an influence on the performance of the thoroughbreds at Santa Anita would like to know the time the Sun rises for every day of the racing season. But the prize should go to the woman who came to the sixty-inch one day and tried to borrow a pencil so she could write her name on the building.

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Are you a fair-to-middle' swimmer with a desire to cleave the water like the fastest lightning? Our chances in the 1948 Olympic games? Or how the Japanese managed to climb from obscurity to the most formidable swimming team in the '32 and '36 Olympics? Robert J. H. Kiphuth, Yale and U. S. Olympic swimming coach, answers these questions and more!

WHO IS THE MOST VALUABLE YANKEE PLAYER?

Nine years ago, Red Roling was with the Boston Red Sox . . . depressed, gaining weight, sluggish. The Yanks bought him, and the tremendous Roling started to concentrate on trimming down the excess aroundpains. Read how purpose overcomes everything . . . including the waistline.

These are just a few of the authoritative articles in the current issue of

THE SENSATION AMONG SPORT MAGAZINES

Athlete

NOW ON SALE - 15c

BUT only a part of the time is spent on Mount Wilson. During most of the month the astronomer comes to his office in the morning and works at his desk much the same as a business or professional man might do. Here he examines the plates taken at the telescope, makes calculations, reads, writes, talks over his observations with others. Probably the most noticeable difference between a pure research institution and a business office is the more leisurely pace of the former. There are no deadlines to meet or orders to be filled by a certain date. The stock market won't slump if the Wolf sun-spot numbers aren't done by the first of the month. Research is best conducted in an atmosphere of this kind, free from distractions and excitement. Which must not be taken to mean that astronomers can't turn it on when they have to. On an eclipse expedition, the strain of setting up a mass of machinery on a desert island, and making sure it will work during totality, can be quite as hard on the nerves as a business conference.

Astronomical investigations frequently involve long calculations of a rather routine nature which are usually turned over to women computers. Wives who

can't keep their checking account straight would be appalled at the sight of mere girls taking logarithms, sines, and cosines out of a trigonometric table as casually as one would look up a telephone number. Determining the orbit of a comet or checking up on the distance to the Virgo cluster are just a part of the job.

Rather curiously, astronomy attracts many women, the number of women graduate students sometimes exceeding the men. And although they do quite as well as the men, very few ever become professional astronomers. For after working eight years to get a Ph.D. degree, and acquiring an enormous amount of highly specialized knowledge, they almost invariably end up by marrying one of the men students and becoming a housewife. All of which can be very discouraging to a university after it has granted them a fellowship of \$1000 to help them be an astronomer.

One often hears surprise expressed at the matter-of-fact attitude astronomers take toward their work. People expect them to regard the stars from a sentimental standpoint, as blazing balls of fire scattered over the firmament, rather than numbers in somebody's catalogue.



or dots on a photographic plate. Thus one may think of Antares as either the flaming red star that marks the heart of the Scorpion; or as No. 22157, mag. 1.22, type Ma, in Boss' General Catalogue. The first designation is more picturesque, but the latter is much handier for reference purposes.

Similarly, the extra-galactic nebulae are not island universes at all, composed of millions of suns, each with its retinue of planets, and satellites, and inhabitants. They are smudges on a film of gelatine—little hazy patches on a photographic plate, to be marked with pen and ink, numbered, and recorded in a notebook. Perhaps at times the astronomer may reflect upon the significance of his work. But more often he gazes upon his photographs of the heavens with the same detached air that an employee at the mint looks at a gold brick.

Let the reader get the impression that an astronomer's life is made up chiefly of petty annoyances and routine calculations, which it is not, perhaps we should take a look at the brighter side, and see how a first-class astronomer rides over the obstacles in his path.

ABOUT 1915 Dr. Charles E. St. John decided to undertake the task of detecting the third Einstein effect in the solar spectrum. According to the general theory of relativity, the spectrum lines in the Sun should be shifted by minute amounts toward the red of their positions in the laboratory, the amount of the shift increasing with increasing wave lengths. It was barely on the limit of visibility, but with the powerful equipment that had just become available on Mount Wilson, it seems worth going after. At any rate, he would be shooting for big game.

Now St. John was not your master-mind type of scientist with all the facts of nature at his fingertips. Instead you

always had to watch him a bit to see that he kept out of trouble. About every so often he forgot where he had parked his car and had to call the police to help him find it. And he was constantly dropping screwdrivers and wrenches into the spectrograph endangering the delicate optical parts therein. Most of his misfortunes arose from his intense concentration on the particular job he had set for himself. He thought about it so hard that the rest of the world ceased to exist.

The most trouble was anticipated from the high pressure in the Sun's atmosphere, which at that time was believed to be five atmospheres or more. Pressures of this order would broaden the spectrum lines and completely mask the relativity shift. But this was true only for atomic lines; those arising from molecules were hardly affected by pressure. So, St. John carefully selected forty-three lines in the spectrum of the cyanogen molecule, CN, one of the strongest in the Sun. (Yes, chemistry experts, I know that formula looks funny. In the Sun at a temperature of 6000°K you get only fragments of molecules—TiO, CaH, and MgH—and not the ones encountered in the laboratory.) He compared the positions of these lines with those of the iron arc under standard conditions. The reduction of the plates by him and his assistants took several years. Their final conclusion was there "is accordingly no evidence in these observations of displacements in the direction of longer wave lengths, either at center or at limb, of the order of the 0.008A required by the equivalence principle of relativity as developed by Einstein."

But in the meantime, the conception of the solar atmosphere had been undergoing a profound change. By 1923 there were powerful reasons for believing that pressures in the outer layers of the Sun, instead of being greater than those in our atmosphere, were in reality

only a thousandth as much. If so, their effect upon the spectrum lines could safely be neglected. Furthermore, on closer investigation his forty-three hand-picked cyanogen lines turned out to be the worst he could have chosen. They were closely blended with other lines, very faint, but still strong enough to cover up the red shift. Later he referred to them as "the forty thieves."

So he began all over again, this time with 500 iron lines distributed throughout the entire visible solar spectrum. One source of error after another was run down and eliminated: pole effect in the iron arc comparison, convection currents in the Sun itself, and the strength of lines at various depths in the Sun. And now things began to fit into place. In unmistakable terms, his measures were showing the red shift of relativity, the slowing down of the atomic clock in the Sun. Eventually, after fourteen years, he was able to announce another confirmation of the Einstein theory, along with the advance in the perihelion of Mercury's orbit and the displacement of stars at the Sun's limb during a total eclipse.

ARE THERE astronomers who would make good characters in a science-fiction story? Yes, I think there are many who would easily qualify, and also enjoy the rôle immensely. Secretly they would like nothing better than to hear that a genuine rocket from Mars had landed in their backyard. And a few signals from Venus or a close brush with a comet would pep up anybody's observing program. For it is action—change—new effects—that make an object less interesting.

Looking ahead to 1941, we see the 200-inch mirror in operation on Mount Palomar, and the 100-inch on Mount Wilson, the largest now in existence, shoved down into second position. Already important work on supernovæ has been done with the 18-inch Schmidt

camera on Mount Palomar during the last three years. All the finest astronomical apparatus that experts can devise—and the budget will stand—are being concentrated on that mountain-top. Lecture halls and observation boughs for the visitors. Temperature controlled developing and ammoniating rooms for sensitizing the plates to the deep infra red, a laboratory, a reading room, and a lunchroom and kitchenette, will make the astronomer's work more comfortable. (The day of the cocktail lounge is still in the future.) Telescopes driven by synchronous motors and the settings in right ascension and declination made as easily as dialing a telephone number.

And work is still in progress on even greater conveniences such as automatic controls in right ascension and declination. This would free astronomers of their most tiresome task today: that of guiding hour after hour on a star trying to keep it at exactly the same point on the photographic plate. The process of guiding is relatively simple, and once mastered, soon becomes monotonous in the extreme.

There is a strong trend at present toward bringing the accessories of the telescope to the highest point of perfection, thus freeing the astronomer of much of the drudge work of former days. But some of the older men shake their heads. They predict it will take more time to keep all the newfangled gadgets in running order, than it would to do it by hand in the old-fashioned way. At any rate, it is doubtful if we will see many entries in the record book similar to one made by one graduate student at the old Princeton Observatory, who is now a dignified director. It was written at a temperature of 11°, and reads:

"Driving clock froze, dome froze tight, reading lamp busted, phone won't work, sidereal clock played out, belts off, fuse burned out, shutter can't be closed—vale!"

NONE BUT LUCIFER



By H. L. GOLD

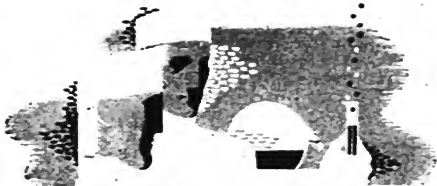
MEMO:
FROM THE EDITOR
SUBJECT,

None But Lucifer

Don't give the plot away!
It's a grim tale. Winds
up with the hero's realiza-
tion of his immortal dan-
gerousness. You'll enjoy its
plausibility. It sounds
too true.

"NONE BUT LUCIFER"
by H. L. GOLD
and L. SPRAGUE DE CAMP
A MUST
on your Reading List

SEPTEMBER
UNKNOWN



BRASS TACKS

AND SCIENCE DISCUSSIONS

Reader report—in detail.

Dear Mr. Campbell:

Reporting on June, 1939.

Five stars maximum.

Two and a half stars is average.

1.—"The Against the Legion," (Part 3) by Jack Williamson (Five Stars).

Everything I said about the first two installments goes for this last installment likewise. If anything, the excitement brightened. It was certainly a worthy successor to the first two Legion tales, and if future Habbala can manage to sustain his steadily weakening families (past and future) it would not be a bad idea to have still a fourth yarn.

2.—"Fights for Life," (Parts 1 and 2) by L. R. de Camp (Four and a half Stars).

Biological articles are my favorites, and de Camp has revealed himself in this one. Extremely interesting and read with absorption indeed. I hope, however, that this doesn't stop writers from making up all sorts of new-type L's, W's, and his imitators forever.

3.—"Pandora's Letters," by Philip M. Morse (Four Stars).

Two words repeating. You have wrote a few well-known words yourself upon the subject in a letter to Astounding in connection with one installment of your astronomical series (I think the one entitled "Interplanetary Invaders") but Morse went into farther detail. I was particularly interested in this business about Medium II. I had never known of it before.

4.—"Time is This," by Arthur J. Eureka (Three and a half Stars).

The best of the Jack McVah yarns so far, though I couldn't seem to believe that the situation was as bad as all that. I know of no other to which the editors were due not become dead and after a short while of continuous nothing. Not can I conceive of an other that can be recommended only by a particular perfume, nor why that perfume should be worse than the stick. It may be admitted, but surely it is at least pleasant rather than odious. Eureka has a habit of stretching out these McVah yarns. They move rather slow.

5.—"Mars," by Earl Vincent (Three and a half Stars).

Now I tell you this is Vincent. I have rarely read a story of his that was even halfway decent, and here he is with an actually interesting and novel story. I believe it is your influence, Mr. Campbell, which changes even the most con-

demned blood-and-thunder author into one who can turn out good stuff.

6.—"Horms of Mars," by Clifford D. Simak (Three Stars).

The writing was all right, and the background (Mars with its Eaters, Mounds, and Sheds, its queer atmosphere and its castles) was extremely good; however, the plot was definitely weak, I think. It is not up to Simak's best, and the story, as a whole, is only slightly better than fair. The girl was dragged in by the hair, and should have been dreamed by the Eaters.

7.—"When the Future Dies," by Nat Schuchart (Two and a half Stars).

Now unlike Schuchart the reading was. Knowing Nat as I did, I did not doubt for a moment that mankind wouldn't come through with flying colors in the end, until the end. The yarn is very fair. It is the same old story (invader, irremediable and destructive, with the same picture of mankind's futile fight and fight). The reading is logical, eminently so, but it's a sorrowful tragedy disguised as a long time.

8.—"Premiere," by Ross MacKinnon (Two Stars).

I didn't like this yarn. Writing was good, but you can say that of all the stories Astounding prints. For my part, the plot was an awfully little thing, and one repetition broader. My tender stomach was turned at the illustration and at the related description. Still's cartoonical "Au" was particularly annoying.

9.—"Cover by George Clineby (No Stars).

I have the pleasure of turning the worst cover since May, 1937, (and was that an awful one?). May I ask what the heck's wrong with the cover, or what it supposed to be, anyway? I think "How do you tell from the cover that Astounding isn't a detective mag. or a mystery mag. or a love-story mag. (that, especially). Yes, I know. You're going to mention the red background, which is supposed to be a Martian landscape. And very noticeable it is, too—end."

10.—Magazine as a Whole—Fiction not quite up to the par of the last year or so, but the articles were excellent.

11.—The Illustration for "When the Future Dies" is a wonder. If only that were a cue to the background rather than one of the "Au's," I would advocate that it be hung up in some academy and labeled "Heck's—Just look. A dead man in the background, bladed trees in the foreground, a grating (Au!) in the foreground, 'Prefer'—your square, 114 West 12th Street, Brooklyn N. Y.

You have the artists' names!

Dear Mr. Campbell:

Re: *June Antecedent*:

"Hermit of Mars"—Good, but not good enough. In fact the best part of the story was the comment you used on the contents page about it. Two points.

"The Maroon"—Excellent. I, for one, would like to see more of Trog and his pals. Four points.

"There is Oil"—Josh McNab redeems himself. Let's see, three points ought to do.

"When the Future Dies"—I don't know about this one. Somehow I liked it and yet I didn't. Two and a half, maybe.

"Promises"—Another mystery. And another O Henry yarn transplanted to the future. Two points.

"Things for Life"—Five points goes to the Camp for one of the most interesting and valuable articles I've seen. Besides, I've always had the sentimental notion that a Marston or a Jew was remembered a human. Thus this article agrees with me in more ways than one.

"Fenders' Love"—Quite good. Two points. "One Against the Legion"—Williamson leads the pack again. Five. If so, I know de Camp got five, too; but his was an article.

A few days ago I got a letter from someone signing himself "Bob Wright." It was slightly derogatory. I like a letter like that; but this misguided angel of mercy either forgot or was afraid to put a return address on his note. So Mr. Wright, if you read this, I invite you to try again, this time including your address. Maybe I'll answer you personally, with a few hints on the graphic art of letter writing—including that of correct spelling. For example, Mr. Wright, I've always considered it correct to spell "editor" with an "e" and "er."

Hold everything! I've just located the short part to be rated. The cover. Well, there was nothing very spectacular about it; don't blame me for forgetting it, do you? How about a change of artists? Where's Weiss and Schenman? And where's the artist credit line in the inside illustrations?

Editors are coming along nicely.

May, 1934, is May, 1933. First place—"Chink of Acid." Second place—"Who Goes There?" Third place—"The Legion of Time." That gives Stuart two, Williamson one. Best cover of the era—Schenman's plate of Bataan—Oswald R. Clarke, 272 Main Street, Waterville, Maine.

"Surrealistic Nightmare"?

Dear Mr. Campbell:

Just can't keep from writing you again, on with a groan of resignation, here goes.

I've been thinking—so kidding!—about the serial problem and have come to some conclusions. There is no denying that a serial operates under a distinct handicap. Some readers—like myself—can't resist the temptation of reading each part as it appears. But this interrupts the continuity, which, in some extent, determines enjoyment of the story. Therefore it takes an especially strong serial to place high. Others—bored with the necessary patience—over their copies and read the serial all at one chunk. But this sort of thing is very wearing on the nerves. So how about this:

If you receive a good two-part novel, simply publish it as a feature novel in the next consecutive issue; then carry the novella or short stories it displaces over to the next issue, similar to the make-up of the July number. Or, if you get a three-part novel, publish it complete as a feature novel; and spread the stories it displaces throughout the next two numbers. (Catch on?) Then both the long story addicts and those who continually clamor for complete stories only will be satisfied. Then, too, the novel will receive a fairer rating in the Analytical Laboratory. Supposing you put this up to the rest of the Brass Tacks?

I suppose, though, that nothing could be done with the Smith type of novel, so go ahead and let dispatches run for half a year. But I think the two and three-part novels could be handled as above to advantage.

So much for that, and on to the July issue. Words fail me. About all I can say is that it is super-colossal, magnificent, terrific, gigantic, and ultra-stupendous! I hope you understand that I liked it. The cover is topped only by Schenman's color plate of Bataan, and is not far behind, at that! This one definitely establishes Gladstone as a top-flight science fiction artist.

Best story? "Greater than Gods." Have heard much of this author's work, but this is the best story by C. L. Moore I've read. I can see that I've missed plenty. A classic in every way, maybe even better than Sturgeon's gems.

A. E. van Vogt makes a truly remarkable entry in the science fiction field with "Black Destroyer." It gets scored by a narrow margin over "The Math." Barklyne's writing is improving with each story. His characters are real, and the ideas was very clever.

Sam, Bolton, and Khon are a welcome sight, and are rewarded in a story equal in merit with any of his predecessors. Let's have more about the adventures of this trio! That this story should get fourth is a pity in the merit of this issue. The rest of the fiction is above average; in fact, Long's story would likely have taken a second, or perhaps a first, in some issues you've given us—and that's no insult, either!

I hope you don't mind, but I've changed my rating system. Now give more points on a maximum of ten. Here's how they rate:

1. "Greater than Gods"—Moore 10	
2. "Black Destroyer"—Van Vogt 9	
3. "The Math"—Barklyne 8	
4. "City of the Cosmic Rays"—Schachner 7	
5. "When the Half Gods Go"—Long 6	
6. "Tender"—Adams 5	
7. "Lightship, No."—Bond 4	

This figure is an average of 7,817, and just to show you how good this is, here are the ratings from January to date: 6,143, 6,230, 6,714, 6,114, 6,500, 6,500, and 7,817. Obviously, this number is a freak and there is little hope of another like it. Still, I may get fooled!

Hurray for the artist credit line! Now I can blithely pass poor illustrations without fear of getting the name wrong, so I hereby give a salute to Kramer and Gilmore. Kramer's illustrations look a trifle muddy, or smoky; and Gilmore's don't look like much of anything. Schenman is just about perfect again, after slipping in the June issue; and Weiss and Orben are both satisfactory.

I do not like the new set for Brass Tacks. Looks like a surrealistic nightmare. The illustrations will probably be like this too long. G-ee!

"Addenda" was informative and intensely interesting, and both articles were good. I really believe, though, that our article on Isaac would be sufficient. But suit yourself—I don't mark rare one way or the other—Robert Jackson, 239 W. State Street, Barberton, Ohio.

"—something that scared you when you were a small child—"

Dear Mr. Campbell:

While resting my feet from a fruitless attempt to beat the law of probability at the long distance free telephone-call lottery in the A. V. & T.'s exhibit at the World of Tomorrow, I'd like to get off a few remarks on the subject of art and artists, about which have been appearing in astounding amounts from time to time. ("Pledge is a night!" "Marionettes with sticks!" And, most mystifying of all, "We want Dada! We want Dada!")

One of the distinctions between an art and

a science is that in an art you can't lay down a set of inflexible rules which any competent person can follow and get the desired results. You can compare the work of artists according to the accuracy of their craftsmanship—whether a picture of a cow actually looks like a cow; whether the pictures are consistent with the story; to a lesser extent, whether they tell the reader what they're apparently trying to. But when you get beyond that, pictures become much like articles of food. Either you like them or you don't, and the reasons have to do less with the artist's ability than with the reader's heredity, glandular balance, and general outlook on life.

In speaking of the experts of artists' work that can be compared, I might say that they, as far as I can tell from the ones I've known, are seldom people of great technical background and training. If they were they probably wouldn't be artists. The result, of course, is that they fall into strange errors now and then. An example is Weiss, Nov. '28, p. 123 (for "The Miller Spoke"). If you want to get a broken finger and perhaps more serious injuries, just try being a Springfield in the position in which the hero is holding his. Or take the same article a picture of a mammoth (Apr. '29, p. 73). You have to assume that Yosemite suffered an injury to his right tank in childhood to account for its peculiar curve. The brilliant cover of a mammoth's back is admittedly not easy to draw, but it's a shame that Mr. Weiss didn't drop up to the American Museum of Natural History to see how the problem is handled by specialists. Quaintest of all was the picture for a story that my friend Clark told some years back in which the artist showed that he evidently thought a spider was a kind of spider hammer (Apr. '32, p. 35—and friend Weiss again. Don't feel badly, Mr. Weiss, you aren't the only one).

If they don't make that kind of mistake, they put things in their pictures that ought not to be there even if the story demands it expressly. I've told them. I've seen the Northwest Victory column on the hero on the cover for last May. Item: the riding boots that they put on their characters at the slightest provocation, this being, for our purposes, other than riding, a most uncomfortable and impractical form of footwear.

Less excusable are mistakes in the shape of human beings which even the most technical artists are supposed to be familiar with. Item: the disproportionately short legs of Dr. Moon in *Recklessness*, Dec. '28, p. 9. Give the otherwise excellent *Farmer* makes mistakes of this type now and then.

Another characteristic of artists is that they learn to draw some particular face well, and thereafter hang that face on every character who can conveniently carry it. The result is that Weiss's young men for instance, all look alike, and they all look like a movie actor named Lin Keith. (See June '29, p. 14, Apr. '30, p. 23, Dec. '30, p. 12.) There has a favorite face of this kind, the familiar round nosed face. Maybe these faces are those of their first models in art school. I think it's probably laziness on the artist's parts, most of them can vary their faces when they want to. (See Weiss's last picture of Mark June '30, p. 79.)

And they all vary greatly from time to time. For instance compare *Recklessness* (excellent picture for "Lionel of Spore" (Feb. '30, p. 117), with his confused and confusing dash for "Rope Trick" (Apr. '30, p. 112). Or compare Weiss's picture for "Narrower Water" (Feb. '30, p. 121), with the waddling effect he achieved in Feb. '30, p. 46, of the same person. (See Nov. '28, p. 123.) I've previously referred to. Besides the error in the young man's standing position, the things are holding their heads with the blunt edges forward. The young lady looks as if she had just finished her first experiment in the art of makeup, and either she's wearing a white oilcloth on the top of her head in shame like a mask. I gave her the even more appalling comic powder effect that Weiss did for the book jacket for "Comic Engineers". And yet I admit that Weiss often does very good pictures.

A picture may be good from a photographic

point of view, or from a symbolic or impressionistic point of view, but seldom both at the same time. A good example of the former is the Weiss picture in Jan. '30, p. 112, previously cited. If you just happen to like only one of these two types of picture, there is no logic in denouncing as incompetent all artists who draw the other type.

About the work maligned Mr. Gladney: Take a good look at his covers for last March and May. Never do we have two human faces (not counting those of the rhinoceros). First they are technically correct—that is human faces are actually shaped that way. Second they are strongly individual faces, some of them to supply a rubber stamp of a pretty or handsome face, and so two of them are exactly alike. Third they all have well marked expressions. I particularly like the worried look on R. H. Adams, despite the rufous and the exploding boots. It takes a man who knows the graphic arts to get that in. (These comments don't apply so strongly to the June cover, but I understand that that was not altogether poor or Mr. Gladney's fault.)

Recklessness does very well with his human figures, but would do better if he would get some of Gladney's expressions into his faces. They're apt to be too blank and placid, thereby robbing his scenes of dramatic force. Also, I think he overdoes the business of showing his characters in three quarters rear view. (A small criticism.) However he can draw a pretty girl that is a pretty girl. See July '30, p. 169. Mmmmm! I want her for Christmas.

As for the readers who cry for food, I find their complaints difficult to understand in view of the fact that the poor man has apparently never learned to draw. Look at July, '30, p. 41, in which he put the paws on the tops of the sparrow-hawks instead of in front. His human beings not only look all alike, but there's no look as if they hadn't had a square meal in years. It seems as though some readers get the idea that because an artist has been willing pictures to their imagination for years they are under some mysterious obligation to insist that he continue to do so, regardless of his merit, or maybe they just prefer the familiar, no matter how inferior it is.

But, in the last analysis, my preference as well as those of the other readers are based, not on demonstrable facts, but on prejudice conditioned by what you are this morning and something that stirred you when you were a small child. Here it is amazing and perhaps helpful to the Editor to read in one comment on pictures. Not to get in a letter over them seems hardly justified—sigh Northrup, 2309 Spruce Street, Philadelphia, Penn.

Artists—and how to use them.

Dear Mr. Campbell:

Thanks for the *Wonderful Astonishments* cover April, Mr. Campbell. I hope it's permanent.

Herewith, a table that may or may not help you with the illustration problem.

Brown—had inside—good on covers. If you steer him clear of conventional human figures, Weiss—generally had inside sometimes good on covers, with the same restriction.

Recklessness—cover bad, but best inside—as an astronomical cover.

Gold—good on covers. Steer him clear of space or semi-space humans.

Orbit—keep away from futuristic schemes, space ships. Good on covers.

Reynolds—good on nothing but space ships.

Fire—use sparingly—made his style so different enough to be refreshing in small doses.

Not so good on covers.

Gladney—steer was away from space ships; another Buck Rogers for instance excellent on covers.

Thompson, Marshall (Lilmore, Boulder, Kentucky, Kramer West, at cover artist, cover, see also James Knight, 302 California Street, Hood River, Oregon).

A cat might stand two feet high, but its weight would be far smaller than that of a two-foot human. De Camp, in speaking of sizes, referred rather to weight than to length. Consider the size of a six-foot black snake!

Dear Mr. Campbell:

What is there about July and the month around it that fosters excellent science-fiction; at least in Antebellum? Looking back in my treasured files I find that the July, '30, issue, really the best of this year, came on the anniversary of that of July, '20, which, in my estimation at least, topped all others in that year, with Earthy's "The Men and the Mirror," Richard's "Imagines Dimension," and De Camp's occasional "Language for Time-Travelers."

Let's analyze the reasons for the all-around excellence of this July issue. Obviously the make-up and art work were superb. That cover! It had that certain weird, other-world atmosphere about it, as the harrowed Terravivante ventures forth for the first time onto the soil of a strange world while the invincible Curculio, all-hunted against the dawn of an alien sun, pines for liberty and plots their destruction. That man Gladney can really paint! From now on we demand at least one Gladney cover every issue of our money back. But if he turns out another splendid paper cover like that on the June cover, send him back to the miners!

I liked the idea of putting the reader's attention in the middle of the magazine. Looks like the problem of the Brass Tacks heading has finally been solved. That top cut is very, very attractive. In fact, all the art work was almost perfect. Not a really bad illustration in the entire magazine!

As for the stories, "Black Destroyer" was a masterpiece similar to "Who Goes There" but even better written. You Torg succeeded in arousing sympathy for both Curculio and his big man enemies. "Greater than Gods" and "Where the Half Code Co." were both excellent enough to take first place in most issues.

You had we couldn't have had something from De Camp. He is the best of your frequent contributors. Let's have a third installment of "Twins for Life," showing the most probable future of life on spacier planets, particularly Mars and Venus.

De Camp made, though, one obvious mistake in the last installment, saying that cat-like animals are too small for much intelligence. Now, most cats are about two feet tall when standing on their hind feet, which is somewhat larger than certain famous midgits, who certainly had normal adult intelligence. That brings up a topic for Science Fictionists. If adult midgits are as intelligent as normal humans, who naturally have much larger brains, doesn't that prove that it isn't the actual dimensions of the brain that matters, but the size in proportion to the size of its possessor's body? And if that be true, you couldn't so intelligent extra-terrestrial be as small as, say, an ant or a bee?—Law Cunningham, Box 222, San Ysidro, Calif.

He pronounces "Ley" to rhyme with "Day."

Dear Editor:

Your magazine is getting better, but your illustrations are getting a little worse. Or maybe you don't try to get good art work. In "Greater than Gods," on page 124, that ray gun looks like a gadget they carry around in a train, a flower engine, I mean. Was it a slip or no purpose? How do you pronounce Willy Ley, the new kid?

To get down to facts, your magazine of July is above par.

"Black Destroyer"—BQ; the features are a

bit uneven, otherwise a devil story; it needs a sequel.

"City of the Cosmic Rays"—A; well up with the rest of that series. Another superb planet. "Greater than Gods"—C; how did the robot work? Good fantasy, only.

"Trends"—A; brief, short story of month.

"Lightship, Ho!"—BQ; I wonder why it wouldn't work?

"The Month"—BQ; a well-written story with good logic.

"Where the Half Code Co."—no science to speak of; well written.

Your cover was only fair!

Ted De Smith not to let "Gray Leeman" drop at the end as "Galactic Patrol" did.

I still would like to know why a machine gun was used instead of a ray pistol, gun, or a thing. Please do not put Brave Tork in the middle of the magazine.—Ted Tress, 607 Greenwood, Topeka, Kansas.

Of course, there are Lucretia Borgias as well as Neros.

Dear Mr. Campbell:

The Rogers combination desires to answer Mr. Antner. To begin with, we are not married! And second, he is mistaken when he says that all philosophers and religious leaders were men. Will he be condescend to tell us the sex of the following? Mary Baker Eddy (started the Christian Science Church), Clara Barton (founded the Red Cross), Florence Nightingale (nursing), George Eliot (authorship), Evangeline Booth (started Salvation Army). Men who have advanced ideas of the strong over the weak are the same over to mention, but I will give you a few of the names. Aristotle formulated the derivatives used by Hitler. There were Napoleon, Mussolini, and Alexander the Great, whom desecrated even Mr. Antner admits.

All in all, we find the issue about evenly balanced, with women in the minority because of suppression by men. Its actual name it was seriously debated as to whether women had souls. In the time of Shakespeare it was considered indecent for women to have an education. Whence the fact that women's part on the stage was played by men. Many universities today are closed to women. If men had progressed against such odds.

We thought the current Antebellum very good and congratulate the editor on the capture of Flinley for next month. The best interior illustrations were Behrman's for "Greater than Gods." All of the stories were up to the usual high standard and we were perfectly satisfied. And, don't you dare give us rough edges!—James Michael Rogers II and Mary Evelyn Rogers, 2006 Court Street, Muskegon, Mich.

"Gray Leeman" starts next month, with a thirty-thousand-word installment!

Dear Editor:

My comment on the July issue—and I'll try to hold it down to a hundred thousand words. Then, and the other covers by Gladney have been nothing to shout about. As examples of the type of cover we prefer, see, in addition to the astronomical planet—Woman's cover for "Hell Ship," Brown's July and October 1934 covers. However, nothing by Gladney is good enough to your covers of two or three years ago. And we wait with interest the cover by Flinley.

Behrman's drawings for "Greater than Gods" were some of the best I've ever seen. Paul illustrated "Terror on the Conqueror" on disk paper. They are equal and strikingly similar in style to Woman at his best. Kramer's work for "Black Destroyer" was good, but if you're going to writer small cuts throughout the stories, let them be drawn for the purpose rather than painting off their old hand-me-downs.

from the days of Marchand. The new cut for Bruce Tarkis will do until something better turns up—just a bit hard on the eyes. And I don't like the style of Urban and Gilmore.

The good stuff in this issue rates as follows: 1. "Greater Than Gods"—a gripping, comprehensive tale! 2. The article, "Tools for Brains"—almost took first place. 3. "Black Destroyer"—4. "Lightship, Ho!" 5. (A tie) "The Moth" and "Wings of the Cosmic Rays."

Thanks for the Address on Atomic Power. But I'd hate to be around it that fourteen million tons of TNT should explode. Let's hope it's real!

I agree with P. R. Miller that one man could be a crew—although it would be rather lonely. In regard to one man running an ocean liner, there is a freighter on the Great Lakes so much so that one man can handle her. And if machinery can be made to operate a telephone substation, strictly it could control a ship in five miles in course, heading and take-off would require a pilot, but there I, with Richard Houston, would prefer to have everything "under my hands" rather than splitting them up among a crew, with a captain to co-ordinate the whole.

Glad to hear that the "Gray Lensman" is coming up so soon. I await with impatient anticipation the further adventures and development of this intriguing character. We wonder—can Mr. Smith develop the Lensman's mental power until he rivals the cybernatic mind of mechanical beings in the "Masters of Tomorrow"? Will the future tire of more intergalactic travel and jump from galaxy to galaxy? Or, perhaps, may they grab of Newton's tank model of the First Universe, and, having disproved that, will they dare the later universal mind in a career fight among the Ex-centered Interuniverses—L. M. Brown, Box 25, Tenby, Wyoming.

If brooding New York weather can't induce men to change their costumes, I'm afraid Astounding can't.

Dear Editor:

The July issue of Astounding held up the high standard toward which you have been building. Rates as follows:

"Over, Very good. One of the best in a long time. The contrasting black and red brings out every detail.

"Black Destroyer"—A—. The psychology of the e. t. creature was well developed. A sequel would be appreciated.

"Wings of the Cosmic Rays"—B—. Not as good as previous stories in the series. Schuchert brings broader physical as well as mental mechanisms.

"Greater Than Gods"—A—. Excellent. Of course she used Williamson's plot of the "Legion of Time." In spite of that, Moore really clicked in this story.

"Trends"—B. Good psychology. Asimov will be a good writer if he can live out his mental quirk into a normal human being. I hope you are successful with him.

"Lightship, Ho!"—A—. Fair story with some old measure plot. Please velocity method not now. You need it yourself in the long ago.

"The Moth"—B. Plot is good and characters are interesting. A sequel here wouldn't hurt. I like the new types of clothing, customs, etc., others that many of Astounding's stories are bringing in. It is possible to mold present-day opinions somewhat thereby.

"When the Half Gods Go"—C plot. Fair adventure.

"Tools for Brains"—B. Too much engineering detail that is not necessary. Can you now summarize the construction of all of the machines described? I must.

"Geography for Young Travelers"—B plot. Lay has commented on a short article what one could learn from several courses in geology, paleogeology, etc., etc.

The Editor's Page. I hope you are right, but

doubt it. I am a little skeptical of the enthusiasm that mathematical physicists are wont to ascribe to their creations.

Bruce Tarkis and Science Discovers. Very poor this time.

Inside Illustrations. Fair.

General make-up. Good.

Best of luck, and wish I could see you at the convention, but I have to work in order to go back to around next year—Thos. S. Gardner, P. O. Box 902, Knappton, Tenn.

Well—don't miss "Gray Lensman" then!

Dear Mr. Campbell:

Here is my rating for the June issue of Astounding:

1. "One Against the Legion"—
2. "The Moth"—
3. "When the Future Dies"—
4. "Prometheus"—
5. "Dance in Oil"—
6. "Hermits of Mars"—

"One Against the Legion" is in my opinion, the best serial that you have published in the past year. I have not had the honor of reading "Marsian Patrol" this third part being the outstanding one. "The Moth" was an original and well-told story. Schuchert's "When the Future Dies" was an excellent story, but I would like to think that the human race will come to a more glorious end than that. The other three stories were average.

William's illustrations for "Prometheus" and "Dance in Oil" were the best in the issue; Urban has done some good work on "One Against the Legion." Carter's two illustrations for "When the Future Dies" expressed the atmosphere of the story very well. Another above-average issue—D. J. Dougherty, 31 Bevil Road, Doutham Market, Norfolk, England.

The probability of atomic power keeps fading in and out in an annoying fashion!

Dear Mr. Campbell:

Following are a few statistics that should interest you. Best stories of 1935:

1. "Who Goes There?"—Stuart
2. "The Master Shall Not Die"—Miller
3. "The Moth and The Mirror"—Karklaine
4. "A Matter of Form"—Glad
5. "Orbit XXIII B"—Willey

Best stories of June, 1936:

1. "Dance in Oil"—Burt
2. "The Moth"—Karklaine
3. "Hermits of Mars"—Glad
4. "When the Future Dies"—Schuchert
5. "Prometheus"—Karklaine

For the July, 1936, issue:

1. "Black Destroyer"—Van Vogt
2. "Greater Than Gods"—Moore
3. "Wings of the Cosmic Rays"—Schuchert
4. "Trends"—Asimov

5. "The Moth"—Karklaine
6. "Lightship, Ho!"—Bond
7. "When the Half Gods Go"—Long

Again you come to the top with the best science articles. The editor's page, "Addenda," was very good. It seems that atomic power is coming sooner than it was expected. That means that space flight will be possible soon—also that the present experiments with rockets will be out of date.

Getting back to our map, I have a few brackets to ring your way. Why do you allow such poor reasons for artists to creep into a good map like Astounding? The ones I mean are Rider, Urban, Hob, and Kramer. Your best artists are Weaver, Lind, Rogers, Schuchert, and Glad. By the way, what has happened to Glad? He was a very good artist—why did you drop him? How's about getting Paul or Mary

to do some illustrating? They both do good covers. Paul had some drawings in *Ascent* years ago. I named one good artist in the above list—John Frey, the fellow that illustrated one of the best stories of the year—"Madden Vagabond," by the Phillips. Don't you think Gladney has done enough in the way of cover illustrating for a while? Give him a rest and give Wrenn Frey, Rogers and Dodd a chance to show what they can do. Gladney is good, but I think variety is a good idea.

I'm glad to see that my favorite author is coming along with another story—K. K. Smith and the "Gray Legionnaire." I would like very much to see his "Daylark" stories in book form, with illustrations by the one and only Wrenn.

Mr. Anderson, in the July issue, hit the nail on the head in his letter about "shop." As to these readers that complain about too much action in the stories, there are several so-called science-fiction mags on the market that contain the kind of "shop" (with apologies to Mr. Anderson) that they should read. *Ascent* and *Sci-Fi* are the only real science-fiction mags on the market today. It is made for a higher class of readers than most of the pulp mags that are sold today.

I don't suppose that this letter will be printed, but at least I got it off my chest. This is my first letter to say mag. as you might have guessed, the reason being that I never got around to it before. I've been a science-fiction fan for the last few years, so it's about time that I look an active part by writing in my ideas on the improvement of *Ascent*—Alvin W. Morrow, 211 West Thirty-second Street, Los Angeles, Calif.

Might say he liked our story "Trends," but not our cover trends.

Dear Mr. Campbell:

First, I should like to state that I believe you have the best science-fiction in the field today. I know that much escapes you here and there, but I know that when my allowance was cut, I had to choose among all the publications in the field, and you will notice I am still reading *Ascent*.

But this letter is written mainly in order of a story in your July issue. Although I enjoyed reading all of the issue, I most enjoyed Isaac Asimov's "Trends." I have read his stories in other magazines, and although he seems to be young, his stories are among the best worked out and most easily defined as "science-fiction." They did not seem to be just adventure stories contrivedly placed to escape the conventions of present-day story-telling, but expansions of present ideas into the future.

I will say, however, that *Ascent* sticks closer than most to the highest ideals of the "history of the future." I hope such success is continued and even expanded. The only thing of which I am complete in the covers of the May and June issues. They could be modified, even among the ranks of science-fiction covers. Why, oh, why do you commit such outrages, especially when you realize that they will be contrasted with your beautiful astronomical covers and covers like that illustration to the story "The Magician of Iron Valley"? With one covered behind you, the former Wrenn, let your readers think that science, but some of these cheap-up covers—Kenneth Anderson, 212 North Maple Avenue, Indianapolis, Pa.

"Galactic Patrol" ran from August, 1937, to February, 1938.

Dear Mr. Campbell:

This is my first letter to your most excellent magazine. The time has come when I must express my appreciation for the many hours of enjoyment I have had in reading *Ascent*. Would you kindly tell me in what issues had

ward Elmer Smith's "Galactic Patrol" appeared?

I think the best story you printed in the past year has been "Who Goes There," by Dan Smith. The only thing, in my opinion, that Smith ever wrote worth reading.

Here is my list of the best authors writing today, not necessarily in the order of merit.

Dr. Edward Elmer Smith
Dr. David H. Keller
John W. Campbell, Jr.
(take a bow, Mr. Campbell)
Kenda Bader
L. Sprague de Camp
Clifford D. Simak
Manly Wade Wellman
Jack Williamson
Ludon A. Gilbo
Arthur C. Clarke

The two worst authors are Van Lorne and Ray Cummings. Not whether in the most on and off author you have. Of all the artists you have, I prefer Schweinmann, with Finley running a close second. By all means keep that correction Frank K. Paul out of your magazine.

From the last two covers you have had it looks as if you were trying to run your magazine mag *Sci-Fi* out of the field. I had to look twice before I picked up the right magazine on the newsstand. By all means continue Gladney to interior illustrations.

Although it could be impossible to publish Dr. Smith's novels in book form, couldn't it be arranged to publish the *Daylark* novels all in one volume?

If the inestimable gentlemen, Frederick Kummer, Jr., and Warner Van Lorne, could be induced to write something with an original plot in it maybe they could produce a story that might be termed science-fiction. Undoubtedly the worst story ever written was "The Blue Mice of Yano."

When you get a story like "Cosmic Engineers" why don't you give the author more room to expand on his plot. Instead of printing stories like those of my pal, Van Lorne. Yours for more novels all in one book—Lisa Bored, 1730 K Street, Lincoln, Nebraska.

But you've got to tell a man what you don't like before he can intelligently improve his work!

Dear Mr. Campbell:

For several years now, I have been an ardent science-fiction fan, and believe *Ascent* to be the ultimate. For that reason, I have been content to sit back and let other fans whip and squabble in the readers' department while I quietly enjoyed that which was good and accepted the bad as inevitable. Perhaps, I reasoned, if I didn't like a story, someone else did—or you wouldn't publish it and pay for it with good, hard cash. Whether a story pleased me or not is an absolute criterion of quality.

However, certain aspects of the magazine finally got my goat and consequently I haven't ever the fray.

I don't like people who are constantly passing someone else. "Wrenn is lousy!" or "Wrenn stinks!" That sort of thing gets in my hair. Personally, I think Wrenn is great—and so are most of the other artists. That they are chosen to illustrate certain stories according to their own particular style and abilities I have no doubt; the artist's job on so highly imaginative a type of material is a pretty big bill to fill.

As much as I dislike hucksters, I absolutely must hate one author. Not because his stories aren't good, but because they aren't *Ascent*'s type. As this will be my first—and probably last—huckle I trust that my transgression of my own ideal will be forgiven.

The writer I allude to is Arthur J. Rark. It seems to me he's out of place. I realize that Mr. Rark is one of the most prolific of present writers, but he has overstepped his bounds.

What Harko should do is pick some untraveled spy and leave introduction to the astronomer.

I do quite a little writing, and have entertained the idea of writing an Astounding yarn, but haven't attempted it as yet. But when I do, I won't even mail it unless I think it puts Harko to shame. And then, if readers think it even worse than his, I won't mind all the heckling I get at all.

I like Astounding chiefly because the fact, authors, artists and editors seem to work together and discuss things—a sort of meeting. For I think the Chairman Editor is a lot too mild with the writers; they need to be put in line. I'll take my audience like a man if they start something!—Earl Frederick Tenley, Milltown, Mont.

SCIENCE DISCUSSIONS

The Greeks had a word for her, anyway.

I hear Mr. Campbell

I don't imagine that I would often be placed in the position of being able to correct the errors Mr. Willy Lay or call him down for incorrect statements. Hence, since I now have the opportunity, I shall certainly keep at it with becoming vigor and an avid liking of him.

In Mr. Lay's interesting article, "Geography for Time Travelers," he mentions the myth "Tethys" as being "Arcturus' mother (150, 1500, 1500, page 124, 3rd paragraph). This is an unpardonable error at which all lovers of Greek mythology must stand horrified—say, aghast! I can hear Homer roaring wildly in his grave!

Arcturus' mother was a nymph, all right—but her name was Thetis, and not Tethys. Thetis . . . by all means, let me not confuse the two.

This comes of a hasty reviewer, paleontologist, and a generally well-versed man of science diving into the abstruse mysteries of mythology. It is indeed a pretty state of affairs when a cited and reputable periodical indulges in misleading statements on matter of such vital import.

I dreamed to know where the editorship was when that mistake passed the blue pencil? With me as that dreamer are all we honest lovers of the good old Iliad and Odyssey—Eugene Ainsworth, 114 Windsor Place, Brooklyn, N. Y.

Hm-m-m—I could try out that Bythobootstraplifter and see if it worked—

I hear Mr. Campbell:

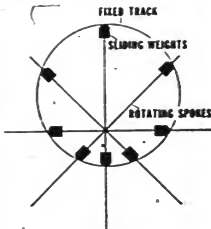
I don't like mark. Tell Mr. Stephen, Dr. Clark, and all their math-sporting friends to fight it out somewhere, else. These small, detailed things get me down, and a mathematical puzzle gets me till I get it, which gives me a whole nervous breakdown. I didn't like Dr. Clark's method of handling that blasted sphere problem, and second up with a terrible integral I discovered to my horror was an elliptic function. Clark was right, and got there easier. If you want puzzles, use the kind that just involve general theory, like the one about this perpetual-motion machine motion?

For instance, we have a buoyant rope running over two pulley wheels, vertically above one another, the one side the rope passes upward through a tall tank of water for mercury (if you prefer) entering through a gasket joint at the bottom. It floats upward. The other, downward, side of the loop simply falls downward. The rope floats up through the tank,

more enters, the wheels spin merrily, and we'll run the world forever, with no fuel!

Trick! I know—conservation of energy says no. O. K. So it does. But give the system only this won't work, even if there is no friction.

Then there's the attached Drew Special Bythobootstraplifter. In the cut we have a fixed, circular track, and an eccentrically mounted, rimless, spoked wheel. On each spoke is a cylindrical weight, arranged to be able to slide up and down on the spoke, and to slide around on the inside of the fixed circular track. Now we rotate the spoked rimless wheel and the weights at high speed. Centrifugal force constantly forces the weights out as far along the spokes as they can go—which means until the fixed circular track stops them. But, because of the eccentric mounting of the rotating spokes, those at the top slide out farther. Centrifugal force increases with the radius of rotation, so that the weights farther out pull away from the center of rotation harder, exert more force than those nearer to the center of rotation.



Drew Special
Bythobootstraplifter

This means that the weights pulling up pull harder than the weights pulling down—and the whole gadget runs upward smoothly, effortlessly, without wings, propellers or balloons. Further, by arranging another one in a horizontal plane, and arranging to shift its line of action, I have a machine capable of unlimited maneuverability in any direction, up, down, or sideward. I expect the war office to call any day after this letter appears.

No, it won't work. That's not the point. The point is, why won't it work? Centrifugal force is even a small weight, at a comparatively low speed, is amazingly powerful. For instance, a blow-out patch put in the tire of a modern automobile develops enough centrifugal force at about fifty miles per hour to lift the wheel off the road with each revolution! If I used eight ton-kilogram weights as shown in the diagram, driven by an automobile engine, I'd be able to lift the car straight up with no difficulty at all—if it worked.

For the theory, you can neglect friction. Actually, if a model were made, using modern bearing metals, and roller bearings, a model two feet in diameter powered by a one-half horse motor could support several thousand pounds in weight—if it didn't have one theoretical dead weight practical flaw. Peter is, that that flaw! It isn't obvious—Charles Drew, 62 Blagden Street, Boston, Mass.

MASSON'S SECRET



By RAYMOND Z. GALLUN

MASSON'S SECRET

With a super-science available—when is a man
dead—and if he isn't dead, is he yet alive?

By Raymond Z. Gallun

Illustrated by W. A. Kell

THEY think he's going to crash, Charlie! Brand Fanshaw . . . our Brand! The astronomers have got their telescopes trained on his rocket. They've got the trajectory of its fall all figured out. They know—unless a miracle happens—just about where it's going to hit the ground, and when? A few miles north of St. Louis. Nine forty three tonight! Two hours, Charlie! Syd is chartering a fast plane. We can make it, Charlie! I know it's almost useless to hope, but we've got to be there—especially you!

Dr. Charles Masson was looking at the disheveled girl who stood in the entrance of his Chicago laboratory. He didn't betray any special excitement at the terrified words that spilled from her lips; but no one knew the tumult that surged in his slight, slender body.

Charlie Masson was still in his early thirties; but he was already famous because of that miracle science he had invented—micro-surgery. If anyone could patch up a broken human form, it was he.

Though space flight was out of his line, yet he could thrill to the magic of its romance. The masked grandeur of other worlds—the thought of craters, tumbled mountains, silent brooding deserts, all lost in the distance of the ether—could make his heart pound with a nameless eagerness.

Brand Fanshaw, his friend, gay and

adventurous, had gone out there to the Moon. He had been the first man of Earth to walk in its nightmare solitudes. And now, coming back with many a tale to tell, Brand was in gravest trouble. Something had happened to the mechanism of his rocket, *Astra's Arrow*. Brand seemed doomed.

"I know, Zada," Masson said quietly to the girl. "I was listening in over the air, of course. The report just came in. I guessed what you and Syd would do, so I didn't try to reach you. I just got out of my work smock and gathered up some of my gadgets." He indicated a small metal case on the floor beside him. "And now, are we ready?" he finished.

Zada Laurin nodded her dark head jerkily. "Hurry, Charlie!" she choked. "Hurry! For Pete's sake!"

Her heart-shaped face was tear-stained, and she was wearing an old riding costume; but she still was beautiful. She might have felt a bit reassured by his own attempt at calm efficiency, Masson thought; but, of course, she loved Brand Fanshaw—not himself.

Charlie Masson patted Zada's shoulder to give her confidence, as they climbed into the taxi that was to take them and Syd Kramer, a young Chicago attorney, to the airport. Though he hardly admitted it even to himself, Charlie had a much more than fatherly

affection for Zada Laurin. But he felt that it was hopeless. Anyway, there was his all-enveloping devotion to his science.

THE THREE intimates of the Moon voyager reached St. Louis in an hour. There, motorcycles which, they had rented by wire were waiting for them. These vehicles are a little more flexible than cars for getting you exactly where you want to go, in a hurry, when a narrow radius is involved. In fact, private cars were barred on those Missouri roads. Soldiers were everywhere on the highways, turning snooters back. And anybody who wanted to get through, into the danger zone—somewhere within which that uncontrolled juggernaut mass, *Astra's Arrow*, was expected to plummet itself—had to have a pass card.

Twenty minutes after their arrival at St. Louis, Charles Masson, dapper Syd Kramer and Zada Laurin, a young newspaperwoman, were straddling their motorcycles by the side of a now-moonlit highway. They had come as near to the site of the expected disaster as predictions allowed. Now they could only wait, and be ready to make a dash for wherever they had to go to get in close when the time arrived.

Between the handlebars of each of their cycles, a radio receiver was mounted, though Zada's and Syd's were the only ones that were in operation.

From Syd's radio were issuing astronomer's reports, sent out from the new Powell Observatory close to St. Louis. The big telescope there was trained on the falling Moon rocket, which was still invisible to the naked eye.

"*Astra's Arrow* approximately three thousand miles in space at present," came the report. "Accelerating rapidly under the influence of terrestrial gravity. Approaching from center of southwest quadrant of sky, about halfway between

horizon and zenith, at this latitude and longitude—"

Like that. But it wasn't those astronomical announcements that bothered the three watchers so much, though there was a mathematical gruesomeness in those words, too. It was rather the combined effect of the light of the Moon on the summer road and fields, and of—what was coming out of Zada's set.

She had her radio tuned to an international hookup that was detecting the faint and scratchy waves that emanated from the lunar rocket itself, and was amplifying them and sending them out again, for the world to hear.

Brand Fanshaw's voice was coming through, now plain as a bell note, and now fading away, as his wavering beam of waves struck a particularly strong portion of the ionized Heaviside Layer, up near the top of the atmosphere, and couldn't get through to best advantage.

Fanshaw was taking it about as cool as was humanly possible. The trio of listeners all knew him well. He was a regular fella. They could all admire his calm nerve, and his keen, quick mind, which, following up John Farwell's recent theories and experiments, had conceived and designed *Astra's Arrow*. He had a strong, outthrusting chin and dark, piercing eyes that still were gay. He wasn't handsome really—just rugged and big. And now, to all appearances, his number was coming up in a blaze of glory. Waiting like this—especially when one could listen to him talk—was like waiting for the execution of a pal. It was pretty hard to take.

"MY photographs and notes are all in the No. 4 locker," he was saying, just a faint vibrancy in his voice that showed he was human and excited. "My samples of the lunar rocks, soils, and so forth, too. The locker is made of three-inch steel. The stuff'll be safe there, I think, whatever happens. The boxes and flasks are all labeled.

"The Moon's almost a dead world now. Though in the crater Copernicus I found some evidence of existing microscopic life. There is still some slight trace of water and air in the craters, you see—at least, in Copernicus, where I landed. I found salt incrustations, and some primitive clamlike fossils, too. The big craters must have been salt lakes, fed by subterranean springs, for a while after the volcanic heat cooled off. But everything's changed now.

"The Moon was too little, and its life span was too short, for it to produce intelligent creatures. It lost most of its air and water too rapidly. There's just relics left—and, boy, what relics! Luna's a hell-world of silence! Its mountains are something but even a poet could describe! Hell mountains that'll never change a bit, except for the sunshine and shadow on them, and at night the Earth glow! It was splendid!"

Fanshaw was trying to say all he could in the few minutes that were left. And now his attention turned specifically to his friends.

"Listening, gang?" he asked. "Hello, Charlie! Hello, Zada! Hello, Syd! I wish you could help me figure this mess out. It's a deuce of a note to be having such a picnic, when everything looked so good! I haven't been able to get the forward blast tubes started, to check speed. Too bad the congealing point of Farwell's fuel is so high. The main fuel pipe is froze up. Should have been better insulated against loss of heat in the cold of space. But I guess I'll get things going for the last minute of fall, anyway. I've got an electric heater wire wrapped around the pipe. Ignition's on. Now I'm going to get into the inertia tank and wait. What happens will prove how lucky I am, that's all. Anyway, Charlie, I hope you're twice as good a fixer-upper of slightly damaged human critters as even all the other big scientific medicos think—"

Think. Yeah! Charlie and Zada and Syd were doing plenty of that then, as everybody everywhere doubtless was. Fanshaw was an inspiration, a world's hero.

And Syd Kramer's aching thoughts groped beyond the superficial tenderness of the moment, wondering, too, about his companions. Glancing out of the corner of his eye, he could see Charlie gnawing at his lips and looking first at Zada and then off into the distance of the heavens, his austere face dumb and pained in the moonlight. She was just staring up into the sky, as though her whole soul was out there in the ether, with the man who was waiting for almost certain death. But she was impotent to help.

Syd was a shrewd, observant man, interested in people. He did not know whether to feel especially sorry for the girl or not. To him it had seemed that there existed between Brand Fanshaw and Zada just a strong brother-and-sister comradeship. Fanshaw had always been just too busy to bother with girls as such, Syd supposed.

"Funny guys, these scientists," Syd cogitated. "Charlie, too, doggone his stuffy old hide! But he loves Zada! You can tell by the way he looks at her. He thinks Brand's the man she loves, and he'd give his neck if he could get Brand back safe, just for her! Oh, well—if I wasn't so comfortably hitched to my Ellen, I'm pretty sure I could fall for Zada myself! Game little kid! And she's keen as a whistle on books, too—"

SYD'S odd, incongruous thoughts were broken off abruptly.

"Well, here's to yuh, gang!"

It was the last sentence from Fanshaw that came out of the radio. But for just a couple of seconds afterward, the *pup-pup-pup* of a little air pump, that was part of the steel coffin he was sealed up in, was audible. Like imita-

tion sound effects! Yeah. Only this was the real McCoy, grim and true, backed up by tons of metal and plunging, runaway power! The noise of the pump helped you understand, as though you yourself were up there in that tiny cabin.

And then two things happened at once. Zada's radio began to roar devilishly, reproducing rocket sounds. In the sky to the southwest, a plume of fire blazed. Brand's retard tubes had started up at last; whether soon enough to do any good was a moot question.

The suddenness of it paralyzed the members of the little party for a second. Though Zada uttered a ragged "Oooh!" Then they all started up the engines of their motorcycles and waited—a bit longer.

It was just a minute before the rocket bit. It made an awful flare behind a hill, three miles or so away. The sound of the smash went rolling back and forth under the stars and Moon, like thunder.

"Let's go!" Zada choked, and she and her companions were under way. They found the proper roads, and made the distance in record time. But, of course, there were people who beat them to it. An army ambulance, fitted up with tank treads for rough cross-country work, was one of their successful competitors in the race. But then, it had happened to be nearer.

They could smell the oily reek of the wreck before they got to the scene—a cornfield. There were white flames shooting up in the night. The fuel and liquid oxygen from the ruptured tanks were burning with a fearful incandescence. But by luck there was no explosion, and with those virulent chemicals so close together, and so ready to unite, it was the kind of fire that would burn itself out quickly. In its very swiftness there was perhaps a slender chance.

In three minutes there was just glow-

ing metal—some of it molten, the rest dreadfully twisted—giving eloquent evidence of the comparative fragileness of even the toughest, hardest steel, when pitted against the Gargantuan might of a fall from space.

The national guard was keeping back people who didn't have specific business or concern. Men, clad in asbestos suits and equipped with crow bars, approached the remains of *Astra's Arrow*, and began to work in the light of the headlamps of the ambulance. The hole in the ground, where what was left of the rocket was stuck, looked like a miniature volcano. It was sickening to think that you've got a friend tangled up somewhere in—that awful mess—or what's left of a friend.

Dr. Charles Masson was hanging onto Zada, as though he was afraid she'd go off the deep end. But she didn't. She was so sharply and calmly lucid that it was almost pitiful. She clung to Charlie as if all her hopes were centered in him—as if he were her light of confidence. Charles Masson—the secretive micro-surgeon.

She looked at him, her eyes wide and clear. "It doesn't seem possible that Brand's still alive, even considering the protective equipment he had, does it, Charlie?" she said. "But if he is alive, and if there's even the ghost of a chance . . . you know you've got to do more than your best. It isn't just that we like him, Charlie . . . or that we want the work he's started to go on under his guidance. It's that the world, with all its economic and international troubles, needs someone spectacular and admirable to keep its mind on . . . to inspire it, to hold it steady, until its difficulties are straightened out. Otherwise it'll turn to dictators and to war—"

Briefly Zada paused. She swung a slender hand out toward the horizon—out beyond the chaotic lights and shouting. "People everywhere," she continued, "are waiting and hoping for news

of Brand. They need a man like him desperately . . . now."

Charlie treated her like a scared child. "I'll bring Brand through safe and sound, Zada," he reassured her. "If I have any opportunity at all—" It was a simple statement, but there was a grimly sincere magnificence in it.

Syd Kramer, looking on, bit his lip.

THE MEN toiling at the wreck got Fanshaw's inertia tank pried loose from that pile of smoldering junk at last. Their hands were insulated by thick asbestos gloves. They carried the tank clear of the wreckage and set it down right in front of Dr. Charles Masson. It was still almost red-hot on the outside.

Brand Fanshaw himself was the inventor of the inertia tank. Though very simple in principle, it was admirably designed to protect delicate things—human beings, for instance—from getting smashed up in any violent physical circumstances.

This tank, in which all present knew Fanshaw or his corpse was hidden, was cylindrical. Its walls were light-weight, triple-layered steel, fitted with vacuum compartments to keep heat out, and braced every which way in their internal structure, to make them as strong as possible. But even so, they were dented in, so that it was difficult indeed to be optimistic.

One end of the tank was intended to come off like a cover that could be fastened and unfastened both from the inside and the outside.

Yes. And there those three friends of Fanshaw's were—waiting and watching, with all the breathless peoples of the Earth in the unseen background, when that lid came loose—

Nor was the truth exposed at once, when the cover plopped down on the trampled cornfield. There was gelatin in the tank—a lot of stiff, clear gelatin. That was all that was visible at first.

As previously stated, the principle of the inertia tank wasn't complicated. It surrounded whatever it was meant to protect with a soft, flexible, shock-absorbing, semifluid cushion.

The ambulance men reached into the gelatin, then clutched and tugged. They pulled Brand Fanshaw out. He had a rubberized, wire-reinforced spacesuit on and a crash helmet. Oxygen mask, too, so that he could breathe while completely incased in the gelatin.

He didn't look so good. His whole body was limp as a rag. Both his legs wobbled below the knees, where there weren't supposed to be any joints. And the front of that crash helmet of his was shoved right back into his head.

Everybody who saw him lying there on the ground was still as death for a moment. Then a radio announcer began to speak in a very low voice into a microphone attached by a long cord to the Central Broadcast radio truck nearby. The truck radioed the words of the announcer to St. Louis, where the large station there rebroadcast them in much stronger impulses, for general reception.

Well, it was Dr. Charles' Masson's turn now, if it wasn't the undertaker's, as the listening world knew. But nobody on the scene paid any attention to what the radio announcer was saying.

An ambulance man held a flashlight, while Charlie removed Fanshaw's helmet and spacesuit, and made his examination. There wasn't anything for Zada and Syd to do, except maybe pray.

"His pulse and heart are still going," Charlie said presently. "Old Brand's pretty tough!"

This was good news for the announcer to tell his far-flung audience—an audience that desperately wanted the first man who had ever reached another world to live.

It was that final retarding burst from the forward tubes of *Astra's Arrow*, and the inertia tank, that had saved him—in so far as he had been saved. The

tank had fought a bulletlike velocity, and had won some minor concessions from the devil. Just a shell of simple steel, it was, lined with sponge rubber and filled with gelatin. It wasn't a thing of magic. In fact, there was something pretty wonderful in its simplicity. But Brand had whacked his cranium on the inside of the tank, anyway, and sponge rubber or not, his whole forehead was pushed in.

WHAT small chance for optimism there was now, lay entirely with Dr. Charles Masson—more appropriately called just plain Charlie. For he wasn't some kind of superbeing—he was very human, he was slight in build, and not very impressive to look at. And the position in which he found himself made him feel extremely inadequate. A terrific responsibility rested on his shoulders.

Masson thought of Fanshaw himself, whom he liked immensely. He thought of the terrific blow to the dream of the conquest of space Fanshaw's death from injuries would be; and he thought of what Zada had said, about the world needing a hero to worship now, in this troubled seventh decade of the twentieth century. But perhaps most of all he thought of Zada—poor little Zada, who loved Brand Fanshaw.

Yet Charlie had nothing to depend on in the successful fulfillment of the job ahead, except known medical science, a conscientious will to do his best, and perhaps a little, grateful flash of genius of his own. No matter how much he might wish for it, there was no magic. And that pushed-in skull of the patient—it looked so—hopeless.

Charlie had to perform an emergency operation right there inside the ambulance. They had most of the necessary

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equipment, and he had brought some of his gadgets out from Chicago in a small metal case.

"I must relieve the pressure from what's left of . . . from Brand's brain," he explained. "His broken legs must be taken care of, too."

Zada, didn't want to bother him, of course, when he was so vitally and importantly busy; but she just had to be as sure as she could. "That's bad, isn't it, Charlie?" she asked tremulously. "The brain . . . crushed like that?"

"Yes, Zada," he returned, attempting a short grin. "Only don't let it bother you too much. Men have lived useful lives after the removal of cerebral tumors, which made necessary the removal, too, of large portions of the brain tissue itself."

Syd Kramer knew that Charlie told mostly the truth there. But he had an idea that Masson was kidding some, too, where Fanshaw's special case was concerned, to lessen Zada's worry. Charlie never would be sentimental in his talk with the girl, however. Just father-daughter stuff—though he was still a young man. But then he was a kind of martyr type—and sort of shy, in spite of his greatness.

Syd knew a lot about folks. Now Zada and he just waited outside the ambulance. When Charlie came out briefly and said, "Brand has a chance, but it will take a long time to build him up again," Zada burst into tears of relief. It all made Syd feel very uncomfortable.

"Syd, he's wonderful!" she sobbed. "Charlie's wonderful!"

The young attorney didn't know just how to interpret this statement, but he wished Charlie had heard it. But Masson hadn't. He was back in the brilliantly lighted interior of the ambulance once more, to supervise the care of the patient.

PRESENTLY Zada and Syd were following the ambulance into St. Louis with their motorcycles. There, they and Charlie took the patient aboard the last plane they had chartered, and proceeded back to Chicago—to Charlie's laboratory. Charlie wanted Brand left there with him. He had the Fanshaw notes, samples, and photographs, too, brought back from the Moon. Protected by the steel locker into which Brand had put them, they had not been damaged in the disastrous finish of the flight of *Astra's Arrow*.

"Beat it, you two," Charlie said with a mild and tired good humor, behind which was hidden a responsibility as heavy as the ages. "I've plenty to accomplish, and with you gawping I get nervous. Come back in the morning."

Syd and Zada understood and obeyed. At least, they thought they understood. They didn't know about the sorrow that Charlie felt—a sorrow for Brand Fanshaw, their friend. And they couldn't see all the driving force that inspired Charlie. The world needed a hero, yes—but there was much more. For instance, there was the mystery that lurked out there toward the midnight stars, and in those notebooks and films of Fanshaw's, and those flasks of ashen lunar dust. It was the mystery of space—the pull of a dream that must go on to realization. Then, too, there was Dr. Charles Masson's own science, which must be advanced when the opportunity presented itself. And there was more—still more.

So, all through the night, Charlie toiled as Pasteur before him must have toiled. Lights glowed. Metal clinked. Delicate diagrams were drawn. X rays fulfilled their magical purpose—while the world waited.

At dawn there was a silent crowd before the Masson laboratory. Police were on guard. "What news of Brand Fanshaw?" was the tense, whispered question. Even a slant-eyed general,

somewhere in the Far East, was neglecting his plans of military aggression to wonder, and to feel a vague romantic hope linked up with the stars, and with a small, quiet miracle worker, named Charles Masson.

Zada Laurin was the first to be admitted to the laboratory. Syd Kramer came in a little later. Charlie showed them Fanshaw. The latter was lying in bed in a small room rigged up as a hospital. His broken legs were in casts. His head was bandaged, and he was breathing heavily, like a drunkard lost in slumber. That was all.

"What shall I write for my newspaper, Charlie?" Zada asked quietly.

Charlie seemed to have this part planned, too, knowing the importance of inspiring hope in the waiting populace. "Tell them that I think everything will be all right, Zada," he said. "And you might . . . have the paper print a picture of . . . this."

In his slender hands he held a surgical instrument he had invented. It was a marvel! There was a long steel arm or standard that could be clamped on the edge of an operating table. At the end of the arm was a binocular microscope. Beneath the latter were hundreds of screw buttons. And gathered right where the microscope was focused—where a needle-point beam of intense light could be projected for illumination—there was a ring of tiny metal prongs. You turned screws below, and the prongs moved—any or all of them—in any plane or direction you could mention, and with caliper slowness, minuteness and precision. At the end of each prong was a surgical tool—blades, tweezers, probes—so fine you could just see them with the naked eye.

Micro-surgery! In this instrument, everything was present to accomplish the most minute of surgical work. The microscope for vision, and those tools that could make the tiniest, most exact stroke! With an apparatus like that, it

wasn't hard to believe that one could sort out and rejoin properly each of the countless, individual fibers of, say, a severed optic nerve.

Just seeing that instrument brought a smile to Zada's lips. It increased her confidence in Charlie, though she couldn't realize the magnitude of the job he was up against.

For a long time, as the days and weeks passed, Brand Fanshaw remained almost the same. It was three months before he spoke—just a few words—while Charlie was out of the room. "Good mornin', folks. How . . . is . . . everything? Nice to—" That and a sleepy grin—Brand's old, familiar grin. Nothing more. Fanshaw slipped back into a coma again.

But Zada and Syd, looking on, were jubilant.

They told Charlie what had happened when he came back into the room, and he seemed pleased, though not surprised.

"It's certain that Brand will get well now, isn't it, Charlie?" Zada demanded breathlessly.

Dr. Charles Masson looked very weary and worn, because of his almost continuous work and strain, and the little sleep he'd had through those weary months. But he nodded triumphantly.

"Almost certain, Zada," he said. "There's still a lot to do—X rays to take every day, just to be sure no infection develops and to see whether everything is all right. But Brand will be almost his old self in thirty days, I think. You can give the news to your paper, Zada."

She regarded him with misty eyes that somehow were a trifle hurt. Then for just a moment she threw her arms around his neck impulsively. "Take care of yourself, Charlie," she pleaded. "You've just about worn yourself out."

His lips curved up in a cryptic expression that betrayed nothing of Masson's thoughts.

During the succeeding month Brand

Fanshaw showed scant improvement, however. Another cerebral operation had been necessary, it seemed. He continued to lie in a coma, most of the time. Only once he mumbled something, when the girl and the young attorney were around. Charlie had been busy in another part of the laboratory at the time, but he said afterward that Brand would probably come out of his daze suddenly.

JUST four months after the smash of *Astra's Arrow*, Charles Masson disappeared. Coming to the laboratory one morning, Syd Kramer found Zada pounding on the locked door and ringing the bell insistently. He helped her to make a louder noise, but there was no response except a faint voice murmuring from inside. The cop out front, guarding the place, hadn't seen anyone leave in the night.

One of the windows was unlatched, and at the officer's suggestion—since the attorney was well known to him—Syd got in that way. He went all through the place, searching rooms he'd never been in before. But he didn't find Charlie. Then he went back to the room where Fanshaw was. He was still in bed, and only dazedly conscious. Syd had thought him still completely inert before; but now it was obvious that it was he who had called, responding to the knocking and the ringing of the bell.

"Where's Charlie?" Syd asked worriedly.

Brand looked up at him dazedly. He seemed to be emerging from the fog at last.

"Why . . . I don't know," he said. "Isn't he here? Don't look so scared, Syd! Nobody'd hurt Charlie!"

Kramer was irritated and nervous. The silence in the lab was brooding and heavy. "I suppose not!" he grated. "But, man! Charlie worked himself half crazy over you! He was sick, Brand! There's no telling—"

Fanshaw seemed to get what the attorney said. Suddenly he swung his legs to the floor—legs that had been recently broken. He tried to stand on them now, but he'd been in bed for so long he would have forgotten how to walk even if his limbs hadn't been injured. So he sat down on the bed again.

"Damn it, Syd!" he cursed. "It's tough to be tied down like this, just when, perhaps, Charlie needs me! Only we shouldn't worry too much. He might have good reasons for leaving. Some errand—"

"Errand . . . my foot!" Syd shot back at him, feeling again that touch of a dread namelessness. "He wouldn't have left you alone here for a minute . . . without getting someone to watch every breath you drew! Unless . . . there's a reason . . . that we can't even imagine!" Syd's voice was husky and wavering now. "We've got to go into a council of war about him! Where's Zada?"

Thus reminding himself of the girl, he noticed the pounding on the outside door. He'd forgotten all about Zada, waiting to be let in.

"Hey, Syd!" she was shouting plaintively. "For Pete's sake! Open up!"

Syd went down the short hall, and with a muttered apology, opened the door for the girl. Here he spent a moment explaining to her that Masson had vanished without a trace.

When they entered Fanshaw's room, they found that Brand had managed to reach the radio and turn it on. He looked up, smiled at the girl briefly, and then turned his attention to the radio again. Zada's eyes widened in startlement, seeing him so improved.

But Fanshaw, now, was occupied with a matter perhaps more vitally important than the question of what had happened to Charlie. The expression on the Moon voyager's face had now become an ugly grimace of irritable determination.

From the radio, some militarist was raving his head off—slinging threats right and left—threats which happened to be backed up by cannons and airplanes and millions of men. Such had been the way of the world for the past several decades. Free democracy had always been menaced by totalitarian aggression.

Brand's lips twisted. "I'm gonna squeak that guy!" he hissed. "Him and all the other windbags in his category! Somebody help me to the telephone!"

Zada was right there to take the order, like a faithful brownie. Together she and Syd assisted Fanshaw into the next room, where the phone was located. Without the support of their shoulders, for his big body, Brand's weak legs would have crumpled under him. Yet his determination helped, too.

Seated in a chair, he called Central Broadcast. When he told them who he was, they cut a big musical program off, right in the middle, and gave him radio connections through the phone service.

Then he began to talk—of stars, of space, of Moon mountains and strange fossils. And of further interplanetary ventures that were sure, now, to come to pass. On to Venus! On to Mars! Romance, it was! And outside the laboratory a silent crowd began to gather again, knowing that Brand Fanshaw, the idol, was near to recovery.

In many places in the world there was broadcast censorship. Still Zada and Syd could almost feel the listening audiences of the dictators and fire peddlers drifting away from them, to listen to matters more interesting—more fascinating—than international and factional dissensions.

In Syd Kramer's throat, there was a lump of gratitude. Briefly, he almost forgot about Charlie Masson, who had given a hero's lack to civilization, and then had disappeared.

Not so Zada Laurin. She tugged at Syd's coat sleeve. "Come on, Syd," she whispered. "Let Brand talk. He's doing his part. Our job is to find Charlie—if we can—if something dreadful hasn't happened to him—"

OUT in the street they talked to the cop, but he couldn't tell them anything. He hadn't seen Charlie leave, though the latter might have gotten out of the laboratory by the back way, without being observed.

Syd regarded the girl steadily for several seconds. He saw the pain in her dark eyes. "You love Charlie, don't you, Zada?" he asked sympathetically.

She nodded without hesitation. "Yes," she said. "He's greater, even, than Brand. But it isn't that. I don't know just what it is . . . exactly, except that he's . . . so fine! And he's always . . . just good old Charlie—"

Syd thought he understood, though he couldn't be sure. "What'll we do now?" he asked. "Notify the police?"

"I suppose so," the girl returned. "Though I know Charlie wouldn't like any publicity. We can tell them to make a quiet search. I've got a lot of newspaper contacts, and you know plenty of people, too. We can start asking and whispering around. Oh, I hope someone has seen him!"

Well, they followed that plan. But during a whole week of increasing concern, it didn't get them anywhere at all. Brand, for his part, was busy with plans for his personal-appearance tour. And though his head was still bandaged, he was getting himself out of his invalid state, learning to walk again. He continued to live at the laboratory.

Syd dropped in there early one afternoon. The expression on Brand Fanshaw's face said "Good news!" very plainly.

"Charlie just phoned!" Brand announced. "He particularly wants to see

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you, Syd. We've got to go to him!"

"Where?" the attorney demanded. "Where the devil has he hidden himself—and why?"

Brand's face went grave, and the "good news" look vanished. "I promised him," he said, "that I wouldn't let you in on a thing, unless you gave your word that you'd keep absolutely still—telling no one. Syd—no one, ever! He was dead-serious, Syd."

"Seriousness means trouble," the attorney thought, and this made his audible response to the strange condition emphatic with a kind of dread.

"O. K., I'll keep still!" he shouted. "Now—good night—spill it!"

"Charlie's living in an old farmhouse about thirty miles out of town," Fanshaw answered. "He told me where to find it. That's all I know. But we can drive there in a little while."

"Then let's step on it!" Syd growled. "My car's outside!"

"Sure," Brand said, with a shrug. "Only it might help if you relaxed, Syd."

Young Kramer wasn't as good as usual at relaxing. He was on pins every second while he drove. And when they reached that little stone house, way back from the highway, behind a grove of ragged trees, and walked up onto the silent, brooding porch, Syd didn't feel any better. A spell as nameless as that of a frigid lunar night was upon him.

Fanshaw rapped at the battered, weather-worn door a few times. Getting no response, he tried the knob. The door wasn't locked, so he just shouldered his way in, brazenly. Syd followed.

"Hey, Charlie!" they both shouted together.

They heard a distant grumble from up the darkened stairway: "Is that you, boys? Stay where you are. I'll be down in a minute."

Brand chortled, as if with relief. "Take your time, Charlie!" he called.

Then he spied an old couch by the

window. He tossed off his coat and hat, and plopped himself down at full length, his nonchalant manner accentuated by a sleepy yawn.

"Brand Fanshaw always did have a lot of crust," Syd reflected silently. "But I suppose his actions are all right, considering that he knows Charlie so well."

"This is probably just a wild-goose chase," Brand said depreciatingly. "Wake me up, Syd, if Charlie says anything important."

Not more than a minute later, he was breathing heavily in slumber. As far as Syd knew, he'd always possessed that Napoleonic knack for wooing Morpheus right away. Then, too, Brand had been very busy during the past week, preparing to organize his Lunar Exploration Society. He hadn't had much time to sleep.

Presently Charlie came down. He laughed when he saw the Moon voyager lying there.

WITH CAUTIOUS gestures, Masson removed part of the bandage from the slumbering Fanshaw's head, to show the attorney how the healing beneath was progressing. The scars were bright-pink lines, not quite knit. But the arch of that once-crushed forehead was normal again. A silver plate, there, must take the place of shattered bone.

"Let him sleep," Charlie chuckled, with a wink of mystery, that somehow had a confusing depth to it—a hint of the unguessable. "My workshop is upstairs. Come along, Syd."

Kramer followed him, beginning to feel mighty queer—nervous excitement, it was. He half knew that he was mixed up in something big—that he couldn't get at. He wanted to ask quick, breathless questions—a lot of them. But he couldn't even quite formulate them in his mind.

Masson's workshop was just an old bedroom, not even painted over, yet, or

fixed up for the purpose it was going to serve. There was a considerable number of metal cases piled in one corner—doubtless containing Charlie's various surgical paraphernalia. Here was the evidence of his quick, nocturnal departure from his well-equipped city laboratory.

Charlie's brows drew together, as if he was trying to judge just where to begin telling Syd—whatever was on his mind.

Then he looked at his guest quickly. "Sit down in that chair, Syd," he ordered at last.

Kramer obeyed.

"You know a little about the structure of the human brain, don't you, Syd?" the micro-surgeon asked after that.

"Not much," Kramer responded. "There's the cerebrum, or higher brain, which contains the gray matter. Then there's the cerebellum, way in the back and down low—together with the medulla oblongata, which attaches to the spinal cord and controls habitual movements of the human body. Both the cerebrum and the cerebellum are divided into two halves, like the meat of a walnut."

Masson forced a short guffaw at Kramer's quaint comparison.

"That is correct," the scientist said. He fidgeted for a second, as if he were afraid of the things he had to say now. He was secretive by nature, but this was only a minor reason. Then he swallowed uncomfortably and continued:

"Consider the cerebrum alone, Syd. The gray matter which covers its nerve-tissue core is divided into various areas with special functions—speech, sight, memory, reasoning and so forth. Most of these areas are up in front—get this, Syd!—near the forehead! And in this forebrain region is the seat of the ego, the consciousness, the intellect, the personality!"

Suddenly Kramer's hide was prickling all over, for he remembered how Brand Fanshaw had been injured—his whole forehead pushed in—smashed!

Charlie went over to one of his metal cases, and opened it with those swift, efficient fingers of his. He took out a glass jar and held it for his friend to see. In the jar was a tiny metal cylinder, completely surrounded by gelatin—perhaps almost the same kind of gelatin that Fanshaw had used in his inertia tank. Ingrained in this clear substance, and originating and radiating from the cylinder itself, were hundreds and hundreds of the finest of silvery wires.

"What is that thing?" the attorney demanded.

CHARLIE MASSON grimaced tiredly. The marks of strain, and of long months of almost incessant work, were very evident on his thin, austere face, then; though there was a certain deep satisfaction in his air.

"The cylinder?" he questioned. "I call it my neuronic receptor-transmitter. I assembled two. This is an extra one—to use if anything happens."

"Don't talk Greek!" Kramer blurted.

"Have a little patience, Syd," Charlie responded. "I'm doing the best I can. I have had theories for a long time. I made various experiments with dogs. Most of the equipment which I'm using now was completed long ago. That was fortunate—when I had to hurry. You know that nerve currents—brain currents are the same fundamentally—are partly electrical. Small electric currents can stimulate them. And a small wire, for instance, can pick up the current a nerve generates, transmitting a motor or sensory impulse just as a nerve itself would do, though in an entirely electrical form. At least, this is what I've found to be true—"

Charlie halted there. Syd Kramer, his face dazed and intent, was beginning to capture a faint glimmer of under-

standing. Or, anyway, his suspicions were strong. Brand Fanshaw's ghastly injury. A neuronie receptor-transmitter—

"And then?" Kramer grated.

Charlie shrugged. "I'm not a super-man, Syd," he went on. "I spoke of the removal of brain tumors once—saying that men could live useful lives with large portions of their brain tissue gone. But if that frontal forebrain area is injured to the point of destruction, the ego, the consciousness—everything that makes a man what he is—ceases to exist.

"That's what happened to Brand. He's really dead, you might say—just a mass of flesh possessing automatic vital reactions, but having no more real self than one of the lower animals. He's lying there, inert now, on the couch downstairs. His flesh is alive—yes. The forebrain isn't really such a vital organ, as experiments with monkeys and other animals, extending back to the beginning of the twentieth century, have proved. But the forebrain is—the self. Fanshaw's was beyond repair."

"But, Charlie!" Kramer stammered. "Brand has been perfectly normal, outwardly, for a week! He's made speeches and acted in an entirely usual manner!"

It was Charles Masson's turn to be impatient.

"Yes," he said. "However, you understand that, for one thing, I know Brand Fanshaw very well. I know how he acts—how he talks. And inside his skull, where the frontal region of his brain was located, is a little cylinder—that other neuronie receptor-transmitter. Its wires are carefully embedded in the proper nerve ends. Gelatin surrounds it, acting as a cushion—something comparable to living substance itself—so delicate tissues will not be irritated—"

Now Charlie Masson's slight body made a sudden turn. He opened an

old rolltop desk. And there revealed was a peculiar box whose slanting front was banked with hundreds of keys. Mounted over the box was a small television screen, dark now.

Kramer had a good imagination. Still he couldn't quite realize the amazing truth.

Charlie picked up a device connected with the apparatus on the desk. It was like the combination earphone and transmitter sets which telephone operators use.

"This," he said, "all of what you see on the desk and in my hands, is the other part—my part: There's a connecting link, of course, between my control apparatus here and the neuronie receptor-transmitter in Brand's head. Waves—refined radio waves, which are beyond the interruptions of static. Carlton's experiments helped me here. And now, Syd, shall I demonstrate?"

Kramer nodded dumbly.

MASSON hung the earphone-microphone onto his head. Then he sat down in front of his apparatus, and pressed a switch. Light flickered behind the ground glass of the television screen. It sharpened to a view of the flowered paper of the ceiling of the room below. Brand's eyes, looking up from the couch on which he was lying, must see that. With the earphones, Charlie must be hearing what Brand's ears were hearing, too. Radio waves, working both ways—to the neuronie receptor and from it—

Swiftly Charlie pressed some buttons. The picture in the television screen wobbled around, as Brand arose from the couch. One end of the room was visible now.

Masson was speaking very low into the microphone, which fitted tight over his lips to keep out interfering sound. Syd couldn't get what he said—directly. But he knew Masson was imitating Brand's manner of talk. He didn't have

to imitate Brand's voice, because—well—there were Brand's vocal cords to take care of that part themselves.

"Hey, fellas! Aren't you through with your gab fest yet? It's getting late!"

Brand Fanshaw himself, to perfection. It was eerie. It was magnificent! But it was well within the realm of possibility, as Syd had begun to see. Nerve impulses, partly electrical, being changed to radio waves by a little cylinder, transmitting sounds and television pictures to the apparatus here! Radio impulses going back to that cylinder, changing there to nerve impulses that commanded muscles and vocal cords!

"Come on up, Brand!" Syd shouted, almost forgetting.

He didn't notice, as Charlie Masson pressed some more buttons; yet the old stairs creaked as Brand ascended steadily. His legs, broken in the crash of *Astra's Arrow*, were completely healed, now, and he had learned to walk again.

"What's going on?" he demanded as he came into the room with a wry, humorous look on his face.

Again it was all so deceptively perfect that the half-memory and half-forgetfulness of how it was done made young Kramer's flesh tingle with an odd, cryptic thrill.

"We're talking . . . Charlie's been explaining . . . about you, Brand," Kramer stammered.

Fanshaw puffed out his cheeks and winked. "That's nice of him," he commented good-naturedly. "I'll sit down on these boxes and wait till you get through. Only . . . mind if I say . . . hurry up?"

He dropped down onto the stack of metal boxes in the corner and leaned back against the wall.

Syd Kramer looked bewilderedly at Charlie, then back at Brand. Charlie snapped the switch of his apparatus. At once Syd saw those eyes of Fan-

shaw's go glazed and dumb—expressive of—nothing. He didn't move except to breathe. But that movement, like his heart action, was controlled by his cerebellum and medulla.

Charlie had pushed the tight-fitting microphone away from his mouth. "You see?" he questioned tensely. "Brand's inert, now that I am no longer in control. Of course, I don't have to guide his every movement. He still has habit, taken care of by his undamaged lower brain. If I started him walking, for instance, he'd go on in a straight line, by himself, unless I worked the controls to make him stop or turn. I have to give him the initial commands, that's all. But it's enough to keep me mighty busy indeed.

"The neuronc receptor-transmitter in his head, by the way, uses up a small quantity of electricity, producing and receiving radio waves and stimulating nerve impulses. But it has a small storage battery inside it, that I can cause Brand to charge very simply, himself, with the proper equipment, and when no one is around to see. There are two metal terminals for charging the battery, just under the skin of his forehead. Needles, carrying current, and pressed through the skin at these points, and at intervals of a few weeks, will do the trick very nicely. Otherwise the receptor-transmitter won't develop trouble, but if it does it can be fixed under the guise of a surgical operation."

SYD KRAMER was a little dizzy as he listened, fitting facts together. In his mind's eye he could see how Charles Masson had done it—how he had worked there in his laboratory over Fanshaw. Brand's skull had been open, exposing that ruined brain. With infinite skill, using that microscopic surgical instrument of his, and his microscopic tools, Charlie had fitted those cobweb-like wires of the neuronc receptor-

transmitter, each into its proper place. Doubtless many, many hours of frequently interrupted work had been required—many separate operations.

Meanwhile, Masson had had to build his control apparatus, using the parts he already had, making others with his own hands. No wonder he was so tired!

Syd choked a little at the wonder of it all. But then the obvious question came up: Why?

"What's it all for, Charlie?" he stammered. "Brand's really dead . . . his personality. Why did you trouble . . . to keep his body alive . . . like this? You'll be occupied during almost your every waking moment! And . . . it seems so useless . . . so—"

"Useless?" Charlie interrupted. "You know better than that, Syd! In the first place this sort of thing is . . . my life work . . . the thing I should want to do most! With this opportunity I

can learn plenty . . . advance the humanitarian cause of surgery and medicine—

"And then—now Brand's career can go on. We've had the importance of that impressed on us before. He's a *living hero*! Oh, he'll never fly into space again—and he'll never invent anything new. But he can inspire others to do so—not as a memory, but as an active agent. I could even cause him to pilot a rocket out into the interplanetary regions—only radio waves will not reach far enough. And perhaps it's best otherwise, not to. He's won his glory. He will organize his Lunar Exploration Society—handle the business end—tell of his experiences. It's not hard for me to fake that part—since I have the notes and photographs he made on the Moon."

Syd Kramer's hands clenched as he glimpsed the strange splendor of Mas-



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son's purpose. Yes, Charlie was right in what he was doing—right as rain! A fantastic double life! Surgical/science, and the slow conquest of space. The thought of the thrilling mysteries of worlds as yet untried by man! Such a dream could smother even the ravings of dangerous, loud-mouthed dictators.

"I gather I've got some part in your scheme, Charlie," young Kramer said.

Charlie nodded, smiling. "Naturally," he told the attorney. "I need someone to bring me whatever supplies I require. Brand could; but having him run out here all the time would look suspicious. Besides, you're an attorney, Syd. You can handle any lawbodies who happen to turn up. It's all a lifetime secret—between you and me. Now you'd better scram, Syd."

Once more Charlie slipped the mike over his lips. He worked switches, buttons. Brand arose from the stack of boxes where he had been sitting and stretched.

"Finished yet with your little tête-à-tête, you mugs?" he inquired amiably. "Come on, Syd! I'm in a hurry!"

Kramer was too fascinated by the bizarre marvel he beheld, to remember certain facts which had been uppermost in his mind earlier in the day.

WHEN he and Fanshaw got out to the car, the latter wanted to drive. Masson, of course, remained in the house, plying his apparatus.

"Can you run a car by this peculiar form of remote control, Charlie?" Syd demanded with some misgivings.

Brand's expression suddenly became facetiously fierce, and he cocked his hat obliquely over one eye, to emphasize his toughness.

"Sure, he can!" he growled. "And stop calling me Charlie! The name's Fanshaw—Brand Fanshaw!"

"O. K.!" Syd returned, getting into the mood of that odd, wonderful pretense.

Brand slipped behind the wheel, started the motor, and sent the car whizzing out onto the highway, which an autumn sunset flooded with golden light.

"What's the rush, Brand?" Syd inquired. "Intend to make another speech this evening?"

"Not this time!" the big Moon voyager answered. "Now that there's a few hours to spare, I'm going on a date—if Zada's willing. Figure she'd make a swell wife, now that I think about it. Naturally she must never know—about me. Charlie'll have to make himself scarce, most of the time, because he and I can never be seen together."

Syd Kramer gazed. This was the most fantastic touch of the whole weird masquerade! Fantastic, and yet how like Charlie Masson, the scientist, the unworldly martyr! And now Syd thought he saw, at last, the deepest core of the hoax Masson was perpetrating. It would be he—really. And he wanted to do the best he could for Zada—give her Brand Fanshaw, whom he thought she loved. Keep her from knowing he was—dead!

Syd smiled wistfully at the man-thing beside him. "You're out of luck, Brand, old boy," he said. "Zada would never marry you. You see, she loves Charlie. Told me so herself. Of course, we'll go on with the sham—about you. I can learn to pinch hit at the keyboard. But we'll have to bring Zada in on the secret, too. Because she's going to be Mrs. Masson. The quicker Charlie leaves you home to sleep—and goes on that date himself—and proposes—the better!"

The face of the living robot went blank, as though Dr. Charles Masson, back there in his farmhouse retreat, had forgotten to push some of the necessary buttons. Syd had to catch hold of the steering wheel to prevent the car from going into the ditch.

ETHER BREATHHER



By THEODORE STURGEON

ETHER BREATHER

They merely meant to amuse—but they constituted the weirdest static in history!

By Theodore Sturgeon

Illustrated by Weiss

IT was "The Seashell." It would have to be "The Seashell." I wrote it first as a short story, and it was turned down. Then I made a novelette out of it, and then a novel. Then a short short. Then a three-line gag. And it still wouldn't sell. It got to be a fetish with me, rewriting that "Seashell." After a while editors got so used to it that they turned it down on sight. I had enough rejection slips from that number alone to paper every room in the house of tomorrow. So when it sold—well, it was like the death of a friend. It hit me. I hated to see it go.

It was a play by that time, but I hadn't changed it much. Still the same pastel, froo-froo old "Seashell" story, about two children who grew up and met each other only three times as the years went on, and a little seashell that changed hands each time they met. The plot, if any, doesn't matter. The dialogue was—well, pastel. Naïve. Unsophisticated. Very pretty, and practically salesproof. But it just happened to ring the bell with an earnest young reader for Associated Television, Inc., who was looking for something about that length that could be dubbed "artistic"; something that would not require too much cerebration on the part of an audience, so that said audience could relax and appreciate the new polychrome technique of television transmission. You know; pastel.

As I leaned back in my old relic of an armchair that night, and watched the streamlined version of my slow-moving brainchild, I had to admire the way they put it over. In spots it was almost good, that "Seashell." Well suited for the occasion, too. It was a full-hour program given free to a perfume house by Associated, to try out the new color transmission as an advertising medium. I liked the first two acts, if I do say so as shouldn't. It was at the half-hour mark that I got my first kick on the chin. It was a two-minute skit for the advertising plug.

A tall and elegant couple were seen standing on marble steps in an elaborate theater lobby. Says she to he:

"And how do you like the play, Mr. Robinson?"

Says he to she: "It stinks."

Just like that. Like any radio-television listener, I was used to paying little, if any, attention to a plug. That certainly snapped me up in my chair. After all, it was my play, even if it was "The Seashell." They couldn't do that to me.

But the girl smiling archly out of my television set didn't seem to mind. She said sweetly, "I think so, too."

He was looking shushily down into her eyes. He said: "That goes for you, too, my dear. What is that perfume you are using?"

"Berbelot's *Deux Rêves*. What do you think of it?"

He said, "You heard what I said about the play."

I DIDN'T wait for the rest of the plug, the station identification, and act three. I headed for my visiphone and dialed Associated. I was burning up. When their pert-faced switchboard girl flashed on my screen I snapped: "Get me Griff. Snap it up!"

"Mr. Griff's line is busy. Mr. Hamilton," she sang to me. "Will you hold the wire, or shall I call you back?"

"None of that, Dorothe," I roared. Dorothe and I had gone to high school together; as a matter of fact I had got her the job with Griff, who was Associated's head script man. "I don't care who's talking to Griff. Cut him off and put me through. He can't do that to me. I'll sue, that's what I'll do. I'll break the company. I'll—"

"Take it easy, Ted," she said. "What's the matter with everyone all of a sudden, anyway? If you must know, the man gabbling with Griff now is old Berbelot himself. Seems he wants to sue Associated, too. What's up?"

By this time I was practically incoherent. "Berbelot, hey?" I'll sue him, too. The rat! The dirty— What are you laughing at?"

"He wants to sue you!" she giggled. "And I'll bet Griff will, too, to shut Berbelot up. You know, this might turn out to be really funny!" Before I could swallow that she switched me over to Griff.

As he answered he was wiping his heavy jowls with a handkerchief. "Well?" he asked in a shaken voice.

"What are you, a wise guy?" I bel-lowed. "What kind of a stunt is that you pulled on the commercial plug on my play? Whose idea was that, anyway? Berbelot's? What the—"

"Now, Hamilton," Griff said easily, "don't excite yourself this way." I

could see his hands trembling—evidently old Berbelot had laid it on thick. "Nothing untoward has occurred. You must be mistaken. I assure you—"

"You pompous old sociophagus," I growled, wasting a swell two-dollar word on him, "don't call me a liar. I've been listening to that program and I know what I heard. I'm going to sue you. And Berbelot. And if you try to pass the buck onto the actors in that plug skit, I'll sue them, too. And if you make any more cracks about me being mistaken, I'm going to come up there and feed you your teeth. Then I'll sue you personally as well as Associated."

I dialed out and went back to my television set, fuming. The program was going on as if nothing had happened. As I cooled—and I cool slowly—I began to see that the last half of "The Seashell" was even better than the first. You know, it's poison for a writer to fall in love with his own stuff; but, by golly, sometimes you turn out a piece that really has something. You try to be critical, and you can't be. The Ponta Delgada sequence in "The Seashell" was like that.

The girl was on a cruise and the boy was on a training ship. They met in the Azores Islands. Very touching. The last time they saw each other was before they were in their teens, but in the meantime they had had their dreams. Get the idea of the thing? Very pastel. And they did do it nicely. The shots of Ponta Delgada and the scenery of the Azores were swell. Came the moment, after four minutes of icky dialogue, when he gazed at her, the light of true, mature love dawning on his young face.

She said shyly. "Well—"

Now, his lines, as written—and I should know!—went:

"Rosalind . . . it is you, then, isn't it? Oh, I'm afraid"—he grasps her shoulders—"afraid that it can't be real.

So many times I've seen someone who might be you, and it has never been . . . Rosalind, Rosalind, guardian angel, reason for living, beloved . . . beloved—"Climb."

Now, as I say, it went off as written, up to and including the clinch. But then came the payoff. He took his lips from hers, buried his face in her hair and said clearly: "I hate your ——— guts." And that "———" was the most perfectly enunciated present participle of a four-letter verb I have ever heard.

JUST WHAT happened after that I couldn't tell you. I went haywire, I guess. I scattered two hundred and twenty dollars' worth of television set over all three rooms of my apartment. Next thing I knew I was in a 'press tube, hurtling toward the three-hundred-story skyscraper that housed Associated Television. Never have I seen one of those 'press cars, forced by compressed air through tubes under the city, move so slowly, but it might have been my imagination. If I had anything to do with it, there was going to be one dead script boss up there.

And who should I run into on the 229th floor but old Berbelot himself. The perfume king had blood in his eye. Through the haze of anger that surrounded me, I began to realize that things were about to be very tough on Griff. And I was quite ready to help out all I could.

Berbelot saw me at the same instant, and seemed to read my thought. "Come on," he said briefly, and together we ran the gantlet of secretaries and assistants and burst into Griff's office.

Griff rose to his feet and tried to look dignified, with little success. I leaped over his glass desk and pulled the wings of his stylish open-necked collar together until he began squeaking.

Berbelot seemed to be enjoying it. "Don't kill him, Hamilton," he said after a bit. "I want to."

I let the script man go. He sank down to the floor, gasping. He was like a scared kid, in more ways than one. It was funny.

We let him get his breath. He climbed to his feet, sat down at his desk, and reached out toward a battery of push buttons. Berbelot snatched up a Dow-metal paper knife and hacked viciously at the chubby hand. It retreated.

"Might I ask," said Griff heavily, "the reason for this unprovoked rowdiness?"

Berbelot cocked an eye at me. "Might he?"

"He might tell us what this monkey business is all about," I said.

Griff cleared his throat painfully. "I told both you . . . er . . . gentlemen over the phone that, as far as I know, there was nothing amiss in our interpretation of your play, Mr. Hamilton, nor in the commercial section of the broadcast, Mr. Berbelot. After your protests over the wire, I made it a point to see the second half of the broadcast myself. Nothing was wrong. And as this is the first commercial color broadcast, it has been recorded. If you are not satisfied with my statements, you are welcome to see the recording yourselves, immediately."

What else could we want? It occurred to both of us that Griff was really up a tree; that he was telling the truth as far as he knew it, and that he thought we were both screwy. I began to think so myself.

Berbelot said, "Griff, didn't you hear that dialogue near the end, when those two kids were by that sea wall?"

Griff nodded.

"Think back now," Berbelot went on. "What did the boy say to the girl when he put his muzzle into her hair?"

"I love you," said Griff self-consciously, and blushed. "He said it twice."

"Berbelot and I looked at each other. "Let's see that recording," I said.

Well, we did, in Griff's luxurious private projection room. I hope I never have to live through an hour like that again. If it weren't for the fact that Berbelot was seeing the same thing I saw, and feeling the same way about it, I'd have reported to an alienist. Because that program came off Griff's projector positively shimmering with innocuousness. My script was A-1; Berbelot's plugs were right. On that plug that had started everything, where the man and the girl were gabbing in the theater lobby, the dialogue went like this:

"And how do you like the play, Mr. Robinson?"

"Utterly charming . . . and that goes for you, too, my dear. What is that perfume you are using?"

"Berbelot's *Deux Réves*. What do you think of it?"

"You heard what I said about the play."

Well, there you are. And, by the recording, Griff had been right about the repetitious three little words in the Azores sequence. I was floored.

After it was over, Berbelot said to Griff: "I think I can speak for Mr. Hamilton when I say that if this is an actual recording, we owe you an apology; also when I say that we do not accept your evidence until we have compiled our own. I recorded that program as it came over my set, as I have recorded all my advertising. We will see you tomorrow, and we will bring that second film. Coming, Hamilton?"

I nodded and we left, leaving Griff to chew his lip.

I'D LIKE to skip briefly over the last chapter of that evening's nightmare. Berbelot picked up a camera expert on the way, and we had the films developed within an hour after we arrived at the fantastic "house that perfume built." And if I was crazy, so was Berbelot; and if he was, then so was the camera.

So help me, that blasted program came out on Berbelot's screen exactly as it had on my set and his. If anyone ever took a long-distance cussing out, it was Griff that night. We figured, of course, that he had planted a phony recording on us, so that we wouldn't sue. He'd do the same thing in court, too. I told Berbelot so. He shook his head.

"No, Hamilton, we can't take it to court. Associated gave me that broadcast, the first color commercial, on condition that I sign away their responsibility for 'incomplete, or inadequate, or otherwise unsatisfactory performance.' They didn't quite trust that new apparatus, you know."

"Well, I'll sue for both of us, then," I said.

"Did they buy all rights?" he asked.

"Yes . . . damn! They got me, too! They have a legal right to do anything they want." I threw my cigarette into the electric fire, and snapped on Berbelot's big television set, tuning it to Associated's XZB.

Nothing happened.

"Hey! Your set's on the bum!" I said. Berbelot got up and began fiddling with the dial. I was wrong. There was nothing the matter with the set. It was Associated. All of their stations were off the air—all four of them. We looked at each other.

"Get XZW," said Berbelot. "It's an Associated affiliate, under cover. Maybe we can—"

XZW blared out at us as I spun the dial. A dance program, the new five-beat stuff. Suddenly the announcer stuck his face into the transmitter.

"A bulletin from Iconoscope News Service," he said conversationally. "FCC has clamped down on Associated Television and its stations. They are off the air. The reasons were not given, but it is surmised that it has to do with a little strong language used on the world premiere of Associated's new color transmission. That is all."

"I expected that," smiled Berbelot. "Wonder how Griff'll alibi himself out of that? If he tries to use that recording of his, I'll most cheerfully turn mine over to the government, and we'll have him for perjury."

"Sorta tough on Associated, isn't it?" I said.

"Not particularly. You know these big corporations. Associated gets millions out of their four networks, but those millions are just a drop in the bucket compared with the other pies they've got their fingers in. That color technique, for instance. Now that they can't use it for a while, how many other outfits will miss the chance of bidding for the method and equipment? They lose some advertising contracts, and they save by not operating. They won't even feel it. I'll bet you'll see color transmission within forty-eight hours over a rival network."

HE was right. Two days later Cine-radio had a color broadcast scheduled, and all hell broke loose. What they'd done to the Berbelot hour and my "Seashell" was really tame.

The program was sponsored by one of the anti-gravity industries—I forget which. They'd hired Raouls Stavisk, the composer, to play one of the ancient Gallic operas he'd exhumed. It was a piece called "Carmen" and had been practically forgotten for two centuries. News of it had created quite a stir among music lovers, although, personally, I don't go for it. It's too barbaric for me. Too hard to listen to, when you've been hearing five-beat all your life. And those old-timers had never heard of a quarter tone.

Anyway, it was a big affair, televised right from the huge Citizens' Auditorium. It was more than half full—there were about 130,000 people there. Practically all of the select highbrow music fans from that section of the city. Yes, 130,000 pairs of eyes saw that show

in the flesh, and countless millions saw it on their own sets; remember that.

Those that saw it at the Auditorium got their money's worth, from what I hear. They saw the complete opera; saw it go off as scheduled. The coloratura, Maria Jeff, was in perfect voice, and Stavisk's orchestra rendered the ancient tones perfectly. So what?

So, those that saw it at home saw the first half of the program the same as broadcast—of course. But—and get this—they saw Maria Jeff, on a close-up, in the middle of an aria, throw back her head, stop singing, and shout raucously: "The hell with this! Whip it up, boys!"

They heard the orchestra break out of that old two-four music—"Habañera." I think they called it—and slide into a wicked old-time five-beat song about "alco-pill Alice," the girl who didn't believe in eugenics. They saw her step lightly about the stage, shedding her costume—not that I blame her for that; it was supposed to be authentic, and must have been warm. But there was a certain something about the way she did it.

I've never seen or heard of anything like it. First, I thought that it was part of the opera, because from what I learned in school I gather that the ancient people used to go in for things like that. I wouldn't know. But I knew it wasn't opera when old Stavisk himself jumped up on the stage and started dancing with the prima donna. The televisions flashed around to the audience, and there they were, every one of them, dancing in the aisles. And I mean dancing. Wow!

Well, you can imagine the trouble that that caused. Cine-radio, Inc., was flabbergasted when they were shut down by FCC like Associated. So were 130,000 people who had seen the opera and thought it was good. Every last one of them denied dancing in the aisles. No one had seen Stavisk jump on the

stage. It just didn't make sense.

Cineradio, of course, had a recording. So, it turned out, did FCC. Each recording proved the point of its respective group. That of Cineradio, taken by a sound camera right there in the auditorium, showed a musical program. FCC's, photographed right off a government standard receiver, showed the riot that I and millions of others had seen over the air. It was too much for me. I went out to see Berbelot. The old boy had a lot of sense, and he'd seen the beginning of this crazy business.

HE looked pleased when I saw his face on his house television. "Hamilton!" he exclaimed. "Come on in! I've been phoning all over the five downtown boroughs for you!" He pressed a button and the foyer door behind me closed. I was whisked up into his rooms. That combination foyer, and elevator of his is a nice gadget.

"I guess I don't have to ask you why you came," he said as we shook hands. "Cineradio certainly pulled a boner, hey?"

"Yes and no," I said. "I'm beginning to think that Griff was right when he said that, as far as he knew, the program was on the up and up. But if he was right, what's it all about? How can a program reach the transmitters in perfect shape, and come out of every receiver in the nation like a practical joker's idea of paradise?"

"It can't," said Berbelot. He stroked his chin thoughtfully. "But it did. Three times."

"Three? When—"

"Just now, before you got in. The secretary of state was making a speech over XZM. Consolidated Atomic, you know. XZM grabbed the color equipment from Cineradio as soon as they were blacked out by FCC. Well, the honorable secretary droned on as usual for just twelve and a half minutes. Sud-

denly he stopped, grinned into the transmitter, and said, 'Say, have you heard the one about the traveling farmer and the salesman's daughter?'"

"I have," I said. "My gosh, don't tell me he spiced it?"

"Right," said Berbelot. "In detail, over the unsullied airwaves. I called up right away, but couldn't get through. XZM's trunk lines were jammed. A very worried-looking switchboard girl hooked up I don't know how many lines together and announced into them: 'If you people are calling up about the secretary's speech, there is nothing wrong with it. Now please get off the lines!'"

"Well," I said, "let's see what we've got. First, the broadcasts leave the studios as scheduled and as written. Shall we accept that?"

"Yes," said Berbelot. "Then, since so far no black-and-white broadcasts have been affected, we'll consider that this strange behavior is limited to the polychrome technique."

"How about the recordings at the studios? They were in polychrome, and they weren't affected."

Berbelot pressed a button, and an automatic serving table rolled out of its niche and stopped in front of each of us. We helped ourselves to smokes and drinks, and the table returned to its place.

"Cineradio's wasn't a television recording, Hamilton. It was a sound camera. As for Associated's . . . I've got it! Griff's recording was transmitted to his recording machines by wire, from the studios! It didn't go out on the air at all!"

"You're right. Then we can assume that the only programs affected are those in polychrome, actually aired. Fine, but where does that get us?"

"Nowhere," admitted Berbelot. "But maybe we can find out. Come with me."

We stepped into an elevator and dropped three floors. "I don't know if you've heard that I'm a television bug."

said my host. "Here's my lab. I flatter myself that a more complete one does not exist anywhere."

I WOULDN'T doubt it. I never in my life saw a layout like that. It was part museum and part workshop. It had in it a copy or a genuine relic of each and every phase of television down through the years, right from the old original scanning-disk sets down to the latest three-dimensional atomic jobs. Over in the corner was an extraordinarily complicated mass of apparatus which I recognized as a polychrome transmitter.

"Nice job, isn't it?" said Berbelot. "It was developed in here, you know, by one of the lads who won the Berbelot scholarship." I hadn't known. I began to have real respect for this astonishing man.

"Just how does it work?" I asked him.

"Hamilton," he said testily, "we have work to do. I would be talking all night if I told you. But the general idea is that the vibrations sent out by this transmitter are all out of phase with each other. Tinting in the receiver is achieved by certain blendings of these out-of-phase vibrations as they leave this rig. The effect is a sort of irregular vibration—a vibration in the electromagnetic waves themselves, resulting in a totally new type of wave which is still receivable in a standard set."

"I see," I lied. "Well, what do you plan to do?"

"I'm going to broadcast from here to my country place up north. It's eight hundred miles away from here, which ought to be sufficient. My signals will be received there and automatically returned to us by wire." He indicated a receiver standing close by. "If there is any difference between what we send and what we get, we can possibly find out just what the trouble is."

"How about FCC?" I asked. "Suppose—it sounds funny to say it—but just suppose that we get the kind of strong talk that came over the air during my 'Seashell' number?"


Berbelot snorted. "That's taken care of. The broadcast will be directional. No receiver can get it but mine."

What a man! He thought of everything. "O. K.," I said. "Let's go."

Berbelot threw a couple of master switches and we sat down in front of the receiver. Lights blazed on, and through a bank of push buttons at his elbow, Berbelot maneuvered the transmitting cells to a point above and behind the receiver, so that we could see and be seen without turning our heads. At a nod from Berbelot I leaned forward and switched on the receiver.

Berbelot glanced at his watch. "If things work out right, it will be between ten and thirty minutes before we get any interference." His voice sounded a little metallic. I realized that it was coming from the receiver as he spoke.

The images cleared on the view-screen as the set warmed up. It gave me an odd sensation. I saw Berbelot and myself sitting side by side—just as if we were sitting in front of a mirror, except that the images were not reversed. I thumbed my nose at myself, and my image returned the compliment.

Berbelot said: "Go y, boy. If we get the same kind of interference the others got, your image will make something out of that." He chuckled.

"Damn right," said the receiver.

Berbelot and I stared at each other, and back at the screen. Berbelot's face was the same, but mine had a vicious sneer on it. Berbelot calmly checked with his watch. "Eight forty-six," he said. "Less time each broadcast. Pretty soon the interference will start with the broadcast, if this keeps up."

"Not unless you start broadcasting on

a regular schedule," said Berbelot's image.

It had apparently dissociated itself completely from Berbelot himself. I was floored.

Berbelot sat beside me, his face frozen. "You see?" he whispered to me. "It takes a minute to catch up with itself. Till it does, it is my image."

"What does it all mean?" I gasped.

"Search me," said the perfume king. We sat and watched. And so help me, so did our images. They were watching us!

BERBELOT tried a direct question.

"Who are you?" he asked.

"Who do we look like?" said my image; and both laughed uproariously.

Berbelot's image nudged mine. "We've got 'em on the run, hey, pal?" it chortled.

"Stop your nonsense!" said Berbelot sharply. Surprisingly, the merriment died.

"Aw," said my image plaintively. "We don't mean anything by it. Don't get sore. Let's all have fun. I'm having fun."

"Why, they're like kids!" I said.

"I think you're right," said Berbelot.

"Look," he said to the images, which sat there expectantly, posturing. "Before we have any fun, I want you to tell me who you are, and how you are coming through the receiver, and how you messed up the three broadcasts before this."

"Did we do wrong?" asked my image innocently. The other one giggled.

"High-spirited sons o' guns, aren't they?" said Berbelot.

"Well, are you going to answer my questions, or do I turn the transmitter off?" he asked the images.

They chorused frantically: "We'll tell! We'll tell! Please don't turn it off!"

"What on earth made you think of that?" I whispered to Berbelot.

"A stab in the dark," he returned. "Evidently they like coming through like this and can't do it any other way but on the polychrome wave."

"What do you want to know?" asked Berbelot's image, its lip quivering.

"Who are you?"

"Us? We're . . . I don't know. You don't have a name for us, so how can I tell you?"

"Where are you?"

"Oh, everywhere. We get around."

Berbelot moved his hand impatiently toward the switch.

The images squealed: "Don't! Oh, please don't! This is fun!"

"Fun, is it?" I growled. "Come on, give us the story, or we'll black you out!"

My image said pleadingly: "Please believe us. It's the truth. We're everywhere."

"What do you look like?" I asked. "Show yourselves as you are!"

"We can't," said the other image, "because we don't 'look' like anything. We just . . . are, that's all."

"We don't reflect light," supplemented my image.

Berbelot and I exchanged a puzzled glance. Berbelot said, "Either somebody is taking us for a ride or we've stumbled on something utterly new and unheard-of."

"You certainly have," said Berbelot's image earnestly. "We've known about you for a long time—as you count time—"

"Yes," the other continued. "We knew about you some two hundred of your years ago. We had felt your vibrations for a long time before that, but we never knew just who you were until then."

"Two hundred years—" mused Berbelot. "That was about the time of the first atomic-powered television sets."

"That's right!" said my image eagerly. "It touched our brain currents and we

could see and hear. We never could get through to you until recently, though, when you sent us that stupid thing about a seashell."

"None of that, now," I said angrily, while Berbelot chuckled.

"How many of you are there?" he asked them.

"One, and many. We are finite and infinite. We have no size or shape as you know it. We just . . . are."

We just swallowed that without comment. It was a bit big.

"How did you change the programs? How are you changing this one?" Berbelot asked.

"These broadcasts pass directly through our brain currents. Our thoughts change them as they pass. It was impossible before; we were aware, but we could not be heard. This new wave has let us be heard. Its convolutions are in phase with our being."

"How did you happen to pick that particular way of breaking through?" I asked. "I mean all that wisecracking business."

FOR the first time one of the images—Berbelot's—looked abashed. "We wanted to be liked. We wanted to come through to you and find you laughing. We knew how. Two hundred years of listening to every single broadcast, public and private, has taught us your language and your emotions and your ways of thought. Did we really do wrong?"

"Looks as if we have walked into a cosmic sense of humor," remarked Berbelot to me.

To his image: "Yes, in a way, you did. You lost three huge companies their broadcasting licenses. You embarrassed exceedingly a man named Griff and a secretary of state. You"—he chuckled—"made my friend here very, very angry. That wasn't quite the right thing to do, now, was it?"

"No," said my image. It actually

blushed. "We won't do it any more. We were wrong. We are sorry."

"Aw, skip it," I said. I was embarrassed myself. "Everybody makes mistakes."

"That is good of you,"¹ said my image on the television screen. "We'd like to do something for you. And you, too, Mr—"

"Berbelot," said Berbelot. Imagine introducing yourself to a television set!

"You can't do anything for us," I said, "except to stop messing up color televising."

"You really want us to stop, then?" My image turned to Berbelot's. "We have done wrong. We have hurt their feelings and made them angry."

To us: "We will not bother you again. Good-by!"

"Wait a minute!" I yelled, but I was too late. The view-screen showed the same two figures, but they had lost their peculiar life. They were Berbelot and me. Period.

"Now look what you've done," snapped Berbelot.

He began droning into the transmitter: "Calling interrupter on polychrome wave! Can you hear me? Can you hear me? Calling—"

He broke off and looked at me disgustedly. "You dope," he said quietly, and I felt like going off into a corner and bursting into tears.

Well, that's all. The FCC trials reached a "person or persons unknown" verdict, and color broadcasting became a universal reality. The world has never learned, until now, the real story of that screwy business. Berbelot spent every night for three months trying to contact that ether-intelligence, without success. Can you beat it? It waited two hundred years for a chance to come through to us, and then got its feelings hurt and withdrew!

My fault, of course. That admission doesn't help any. I wish I could do something—

GENERAL SWAMP, C. I. C.



By FREDERICK ENGELHARDT

GENERAL SWAMP, C. I. C.

Concluding a two-part serial of men against men—and the world-girdling swamps of Venus.

By Frederick Engelhardt

Illustrated by Leo

Synopsis:

Brand Martel, a young Venusian colonist and a leader of the planetary independence movement, is forced to flee his native colony of Arkgonactl when the American-Venusian Corporation, a private company chartered by the Confederate States of the Americas, on Earth, to exploit the colonists, seizes complete control of the archipelago.

With Jack Green, his sergeant in the Venusian army corps during the late wars on Earth, and Tom Dorgan, a hard-bitten swamp runner, Brand escapes on his yacht after luring a "Corp" guard ship to destruction. With other fugitive rebels, they go to the colony of Torgutkluck, where the uprising against the Corp has been successful.

Brand, an experienced soldier, is given the task of whipping the proud, independent, mercurial Venusians into a disciplined army, able to meet the crack mercenaries of the Corp's legion of guards. Before he has completed this task, Torgutkluck is invaded by the main body of guards from Arkgonactl. Brand lures the mercenaries into a trap and wipes out the entire expedition.

Foreseeing the necessity of freeing the other archipelagoes before the Corp can send reinforcements from Earth, Brand browbeats the hesitant Provisional Council into creating a small regular army and navy. Command of the lat-

ter is given to Martin Vician, a shrewd, daring, grizzled adventurer.

While the Council debates, Brand sends aid to the struggling colonists on the archipelagoes of Golubhammon, Mortablanging, Janusking and Hikelungert. All succeed in throwing off the Corp yoke. Confronted by these successes, the Council approves a huge expedition to recapture Arkgonactl, the wealthiest colony and the seat of the Corp's power.

After defeating the Corp fleet on the sea, the expedition anchors off the great hundred-kilometer-wide swamp that encircles Arkgonactl. Reluctant to throw away the lives of his men in a direct attack, Brand instructs the wily Vician to look for a weak spot in the Corp defenses, where the Venusians can break through.

This takes considerable time, and the Venusian militia become restless. They put pressure on the committee of Council delegates that accompanied the expedition, and the latter, playing politics, give them permission to return home. A number of privateers, which make up the bulk of the fleet, also abandon the expedition, despite Brand's protests.

Made desperate by these light-minded defections, Brand allows Vician to talk him into sending a small force into the swamp to make a surprise attack and open the way for the main body. The attackers are "jumped" by a brigade of

Venusian loyalists, who have sided with the Corp. and are wiped out.

A loyalist prisoner then tells Brand that the Congress of the Confederate States, enraged by the revolt, has taken possession of Venus and is sending a full corps of regulars to suppress the rebellion and rule the planet as conquered territory.

BRAND MARTEL leaned on the bridge rail of the *Arkhol Taxpayer* and gloomily regarded the distant fringe of green swamp that marked the boundary of his native colony, Arkgonactl, the Jewel of Venus. Behind him, riding easily at anchor on the placid Blue Ocean, lay what was left of the great fleet that had set out so confidently three weeks before to free Venus of the last vestige of its slavery.

"We've still got a few days left, Brand," said Admiral Martin Vivian, standing at his elbow. Vivian's usual fierce cheerfulness was subdued since his pet scheme for crawling through the back door of the fortified, swamp-ringed island had resulted in the total loss of an expedition of more than a thousand men.

"A few days, a hell of a lot to do, and no way of doing it," Brand retorted bitterly. "We can't even launch a general attack now. We haven't enough men left."

"Haven't you notified the Provisional Council of the danger? Lord, don't they realize Earth is sending a full army corps to Arkgonactl? More than fifty thousand men."

"Notified them? Hah! I've been telling them that every time I've been able to get a councilman on the televisor. You know what they say: 'Arkgonactl will have to shift for itself. The other colonies have their own problems.'"

"And what are they going to do when the enemy lands on the shores of their

own precious colonies? Yell 'boo' at them?"

"They've got an answer to that, too, Vivian. They pointed out that we've destroyed the Corp's battle fleet, and any invading army will be marooned on Arkgonactl. That fat little slob from Yakishikiki told me to just be patient and the Earthmen would go away again when they got tired."

"The whole thing is that these colonists hate to pull together, and the delegates they send to the Council are primarily interested in getting themselves re-elected. They've solved the problem, for themselves, by leaving me here with a few thousand men from the regular army to besiege Ark. Meanwhile, they're playing politics on Torgutkluck."

"Yeah," Vivian spat. "Well, I've got an answer to that. I've just been sweating some prisoners Dorgan brought in last night, and the C. S. A. is shipping a dozen new-style cruisers from Earth along with the army. They're broken down, of course, but they can be assembled in a week in the Wallacetown shipyards."

Brand whistled. "That's bad."

"How many men do we muster now?"

"Less than five thousand in the army, and that's including the two thousand regulars. Another batch of swamp runners went home last night. Said they wanted to harvest the burton crop before it was too late."

"Hm-m-m. I've got the five navy ships and half a dozen privateers left. And about twelve hundred men to man them."

"There's only one answer," Brand said suddenly. "For a while I was inclined to agree with the Council and avoid casualties. But I see now that we've got to attack before the fleet from Earth arrives, seize the spaceport and bar it to them. And they can't land anywhere else on Venus. These low clouds preclude any attack from space."

"That's what I've been waiting three

weeks to hear," the bearded sailor exulted.

"All right. Get back to your flagship. Your squadron will lead the way—right smack into the swamp. It's watery enough along here so a ship can force through. I'll bring up the transports."

Orders crackled over the blue water and the somnolent ships leaped into life. With action in prospect, the mercurial Venusians shed their discontent and eagerly took up their arms. The fighting ships moved into the van and the transports fell into line behind them.

"They're bound to have us spotted," Brand told Vivian over the televisior, "but I'm counting on getting under cover in the swamp before they can bring any ray guns to bear."

THE BOWS of the squat, square-ended vessels lifted as their rocket exhausts drove them through the water. Closer and closer came the green wall—then they were through the curtain and long, sinuous branches whipped the hulls and superstructures.

Ahead, Vivian's fighting ships were clearing the way, blasting stumps and too-thick branches with their ray guns. The transports rocketed along in their wake, but slower now. Behind them a fairly clear channel stretched through the primeval bog, roofed over by the interlaced foliage.

"Keep going, Vivian," Brand ordered. "I want to get as deep into the swamp as possible."

For another two hours the ships bored through almost solid vegetation, but frequent glances at the fathometer told Brand they had plenty of water under them—and the biggest of the transports drew no more than two meters. But their progress was slowing perceptibly. Vivian was zigzagging now, both to avoid rocky islets that appeared more and more frequently and to prevent any following enemy ship from enfilading

the unarmed transports along the line of the channel.

"All right, heave to, Vivian," Brand barked as a cluster of small islands slid past. "We'll base here."

The admiral nodded and swung his ships in a wide circle around the islands, clearing a broad swath through the bog. This would prevent any Corp snipers from slipping up on the camp and would afford room for the transports to maneuver and anchor.

"Well, this is where we are now, roughly five kilometers from the southern edge of Wallacetown," Brand said when the staff officers were assembled in the *Taxpayer's* saloon an hour later. He stabbed a map with his finger.

"We're in an arm of the great swamp that runs deep into Arkgonactl. In fact, it cuts the island almost in two. To the west of us, five or six kilometers through the swamp, is the Ark spaceport. Beyond that is the harbor at the head of the main channel, and the shipyards."

"You figure on taking Wallacetown by assault, sir?" asked Green, standing, as always, by his idol's elbow.

"No," Brand said. "I don't. For one thing, we can't spare the men we'd be sure to lose. You can depend on it, General Waters has already shifted his defense troops to the edge of this inlet."

"Then I don't see how we're any better off than we were before," objected a Golub major. "At least, on the ocean we could have cut and run for it if necessary. It looks to me like we're trapped now."

"We are if we just sit here," Brand snapped. "But we're not going to just sit."

"You've got some plan, and I bet it's a good one," Vivian said. "Let's hear it, Brand."

"We've got two main objectives," Brand went on. "One is the spaceport.

If we can capture that, and hold it, we can set up ray guns and beat off the space fleet from Earth. With no place to land, they'll be forced to return to Earth, and Ark will fall.

"The second is the shipyards at the harbor. They must be destroyed. Then, even if the Earth fleet lands, it will be months before they can rebuild the yards and set up their ships, and meanwhile we'll control the seas."

"What about the city?" the major wanted to know.

"To hell with the city. We can't war on our own people, even if they won't help us. Once we've driven off the relief force from Earth, the city will surrender. Waters can't hold on forever with the few troops he's got left."

"Why didn't you think of this before?" the Golub major wanted to know.

Brand snapped him a look that silenced him.

"Sounds good to me," Vivian said finally. "When do we start?"

"By the way," Brand asked, "did you learn from those prisoners when the fleet left Earth?"

"Ten days ago. The morning of the seventh."

The muscles along Brand's jaw twitched nervously. "Hm-m-m," he said. "And Venus is now—"

"I worked it out," interrupted Vivian. "Allowing for the speed of the slowest transport, the whole convoy will be here about sunset tomorrow. Of course, they may have sent a squadron of space fighters ahead."

"That means we start at once," Brand snapped. "Captain Dorgan, you know this part of the swamp as well as your own face. Assemble all the swamp runners we have. Establish vedettes all around us, then fan out through the swamp toward the west. Drive in the enemy vedettes. The main body of troops will follow in lifeboats."

A FEW more orders and the officers returned to their own ships to disembark their men. Dorgan worked swiftly—ten minutes after he dropped over the side of the *Taxpayer* the first detachment of swamp runners faded into the green wall surrounding them. Half an hour later the lifeboats, each filled to capacity, followed the paths hewn through the thick growth by the skirmishers.

"Hope Waters doesn't have the bright idea of jumping our ships," Brand remarked to the now-serious Green. "I left only a skeleton defense force behind."

"I don't think so, sir. If he's expecting an attack, he'll want all available men with him."

Brand stole a side glance at the old regular. There was premonition in the latter's eyes. For a brief moment a cold hand clutched the young general's heart.

The experienced swamp runners, hardened by a lifetime in the treacherous bogs, were moving quickly and silently through the watery jungle, either in boats or by swinging from branch to branch. They were handicapped, though, by the necessity of keeping in contact with the main body.

Long, slender, brightly colored snakes wriggled out of sight overhead, or dropped into the open boats, from which they were hurriedly dumped overboard. Strange, hideous armored heads rose from the stagnant water unexpectedly, and the city-bred soldiers had to be forcibly restrained from opening fire on them. Weird scaly birds flapped through the flotilla on leathery wings, their harsh screeching bringing many a man's heart into his mouth.

"The men are behaving magnificently," Brand remarked, pretending not to notice the metal flasks of fiery Venusian brandy that appeared on all sides. He realized this silent trip through the sinister swamp was a terrifying experience to anyone unaccustomed to it.

He could still remember his own first sortie into the miasmatic waste, and he had had the veteran Dorgan by his side.

A sharp *spang* shattered the ominous quiet, followed by a volley, and then another. The steady drumming of sustained gunfire broke out all along the line ahead of them. Brand peered forward intently and saw a runner slipping adroitly through the flotilla in a two-man power canoe.

"Captain Dorgan says to tell you we've contacted the enemy vedette line," the runner reported to Brand.

"I can tell that from the firing," Brand snapped. "What's happening?"

"We're shooting 'em, of course," the man replied, astonished.

Brand reminded himself that these swamp runners were difficult at times, and managed to restrain his temper.

"Just tell me," he said, "how many of them are there? How long is their line, and how deep?"

"Oh, I reckon they stretch pretty near around the swamp. But there ain't many. They're in little bunches of maybe three or five, fifty meters or so apart."

"Good, that's all I want to know. Tell Captain Dorgan to have details mop up along our flanks—"

"That's what we're doing," the runner said patiently. He was chewing a local stimulating weed and punctuated his remarks by directing a blue stream of juice into the water. Brand repressed a desire to kick the man in the teeth.

"Captain Dorgan's orders are to push ahead and effect a landing on solid ground. We'll be right behind him."

"O. K.," the runner said. "I'll tell him." He disappeared back into the swamp.

"All right, Green," Brand barked. "Get this flotilla moving. Dorgan must be half a kilometer ahead of us."

The order was passed from boat to boat and the rocket exhausts' crescendo

increased. Darting over the surface like swollen water bags, the small craft moved ahead.

The firing was sporadic now, but still ahead of them. Now and then a dead Corp soldier or a Venusian loyalist in gold uniform appeared, slumped over a branch or sprawled on an outcropping of rock. Brand noticed with interest that there were four or five of the latter to every one of the mercenaries. A canoe with two dead swamp runners sprawled in the bottom drifted past, indicating Dorgan's men were not having it all their own way.

WITHOUT warning the leading lifeboats burst out of the swamp and ran high aground on the muddy shore of Arkgonactl. Their crews leaped ashore, formed in a ragged line and advanced, rifles at the carry. Still Dorgan's swamp runners were ahead of them, deploying over a far-flung clearing. The *spang*, *spang* of the atomic rifles was clearer here in the open.

Brand came up with the second wave. Half a rifle shot away were the backs of the first wave, slogging ahead through the mushy farm land. He hurried forward, accompanied by the faithful Green and half a dozen other staff officers. They passed scores of casualties, some dead, others horribly mangled by the high-velocity slugs. This was war as it was fought on Earth, and it called for plenty of replacements—replacements Brand couldn't furnish.

"I hope we can make the forest yonder," he breathed to Green. "We've got to get under cover, where our boys will be more at home. That's the only advantage we've got."

"Yessir. You're right," Green wheezed as he ran. "This damp open-field fighting is hell. But we can't stop now."

The smell of battle was in the veteran's nostrils, and he was wearing a frightening smile.



"Get that ship!" Martel prayed. "If we can stop their landing troops, we win; if we don't—"

But for a few minutes it looked as though they would be stopped. Several battalions of trim Corp mercenaries debouched from the woods ahead and sprinted into close skirmish lines. They dropped to the ground and opened fire, pumping slugs across the field with trained precision. They lacked the sharpshooters' eyes of the Venusian colonists, but then they didn't need them at that range. The volume of fire they

poured out made up for it.

Brand, listening to the bullets whine about his own ears, saw his men crumple by the dozens. Others, emulating the veteran Corp soldiers, flattened themselves on the ground. Venusian officers, most of whom were trained on Earth, quickly set their men to digging in with hands, bayonets, knives, spoons, anything.

"At least, we're holding our own,"

takes better care of his guns than he does his children."

In the dense, dry woods the opposing forces fought fiercely but in comparative silence. Officers had long since lost control of their commands, and the battle was a conglomeration of man-to-man fights and brief engagements between small groups. But the Venusians were still advancing. The whine of shells passing overhead was incessant, but encouraging.

Then they were out of the woods and running across an immense open plain, scarred and burned for its full length and breadth—the Arkonacti spaceport. The battle was over. The surviving defenders were racing madly to the far end of the field, where the giant frameworks of the launching troughs afforded the only shelter from the whistling bullets.

"We've won!" Brand exulted. "We got here on time! We—*What's that!*"

Every eye turned upward, searching the pastel cloud ceiling. Cheers and cries for aid died away as both attackers and defenders stared spellbound at the scarlet streaks that suddenly striped the fleecy heavens. A steadily increasing roar drummed in the ears of the silent watchers.

"Space fighters from Earth!" Green rasped.

"Maybe we can still keep them from landing." Brand was jerked back into action by sheer necessity. "Lieutenant, contact Colonel Gomez. Tell him I want all his artillery at once. Tell him to set up his guns anywhere—so long as he can reach those damned spaceships. Tell him to throw everything he's got at them. Snap into it."

"Six of 'em," Green said, counting the series of triple exhausts overhead. "They're circling for a landing."

"Waters must be in touch with them," Brand declared. "If they try to land at all, you can bet they'll be ready for action."

"The shipyards!" Green suddenly exclaimed, catching his commander's arm.

"Hell, yes," Brand groaned. "Green, take as many men as you want and cut your way through the enemy. Never mind fighting them. Just get through to the yards. Take thermite grenades. You know what to do."

"Yes, sir," Green, always the perfect soldier, saluted smartly, his face strangely immobile.

Brand held out his hand. "Good luck, Jack. I'll try to help you get away again."

"Thanks . . . Brand." The old veteran turned and hurried across the field, picking up a command as he went. Brand watched him, gulping helplessly as a lump rose in his throat. Jack Green had been a real friend.

"Colonel Gomez is rushing his guns forward, sir," the artillery lieutenant interrupted. "He can't open fire till he gets clear of the woods."

"How long?"

"Just a few minutes."

Again Brand's eyes turned upward. The telltale exhaust streaks were bent half around the horizon now. "Five minutes at the most," he whispered to himself. "Gomez, for the love of Venus, get a move on."

"We've cleared the field, sir," a major reported. "The defenders have been driven back all along the line. They're falling back on the city."

"Damn little good it'll do if we can't stop those space fighters before they land," Brand told him. "Contact the line officers and tell them to be ready to withdraw if necessary. No sense in cutting ourselves off from escape altogether."

THE SCARLET wakes of the approaching space fighters had completed the turn now and were heading back toward the field. They appeared brighter and plainer—and their advance through the clouds was slowing per-

ceptibly. Moreover, Brand noticed with a start, the fiery bands were now parallel.

"They're coming in abreast," he muttered. "No doubt about it now. Waters has tipped them off and they're ready for action."

The artilleryman nudged Brand's arm and the latter glanced toward the edge of the field. Gomez's sweating gunners were hauling their lean field pieces into line and setting up mortars. Little knots of officers clustered around instruments. The professional little artilleryman knew what was expected of him. He caught sight of Brand and crossed to him.

"Too damn bad we haven't the big ray guns from those Corp battlewagons," he said mournfully. "We could blast these ships out of the sky."

"Think anything of our chances now?"

Gomez shrugged his shoulders—a gesture inherited from his distant Latin Earth ancestors.

"Maybe," he said. "No use trying to pick them off in midair. They'll come in too fast. I'm going to let them land, then hit them with H. E. That way we'll get the best results, with what we have."

"Well, we'll know in a minute. Here they come! Take shelter!"

Brand dropped to the ground and through a tuit of scorched, leathery weeds watched the six golden space cruisers drop out of the clouds. The glittering, round bows of the teardrop-shaped hulls seemed to fill the sky.

He glanced at little Gomez, sprawled beside him. The artilleryman had taken the communication set from his subordinate and was in contact with his guns, ranged along the wall of trees to their left. His deep, studious eyes never flickered as he mentally estimated the speed of their targets. Brand squirmed around and noticed that the guns were placed so as to rake the line of spaceships with an oblique, enflading fire.

Gunnery, he realized, was an art with Gomez.

The next few seconds seemed eternities to the impatient young Venusian. He writhed under the involuntary constraint. But there was nothing to do. The golden, globular bows of the enemy fleet seemed to hang immobile in mid-air as the cruisers' magnetic brakes, gripping the tremendous mass of the planet, slowly dragged the hurtling ships to a stop.

Great sheets of flame roared from the cruisers' sterns, counteracting the gravitational pull of the planet and checking the fall. Closer and closer to the field came the six ships. Now they were over the edge and settling for a landing. The strip of sky between their bellies and the crest of the forest diminished, then vanished. The ground shook as they drove into the field and skidded for half its length before coming to a stop.

"Now!" Brand shouted.

GOMEZ'S fingers played over the oblong panel in his hand and the entire battery line burst into flame. The men's ear drums quivered under the terrific concussion of the high explosive as the space fleet disappeared behind a curtain of smoke and flying dirt.

Again and again the guns roared. Gomez's unblinking, glowing eyes remained riveted on the targets, which gleamed now and then through the spurting, whirling mélange. For ten full minutes the cannonade continued, answered only occasionally by flashes of light from the cruisers' ray guns.

"It's no good, general," Gomez finally remarked in a heartbroken tone. "We're not even making a dent in those chrome-bronze hulls. That armor was built to withstand anything."

Brand raised himself on his elbows and peered forward. Gomez's remark was not exactly accurate. He could see where strips of the armor plating had



The flank attack failed under the swords of the men and the savage beaks of the teufels.

been torn from the golden hulls, exposing the interiors of the cruisers. But there were not many such holes, and as the ships were aground, they could not by any stretch of the imagination be called incapacitated.

"How long can you keep up this bombardment?" he asked.

"Another ten minutes, I'd say," Gomez replied dully. He seemed, Brand thought wildly, about ready to cry. "We were short on ammunition from the start, you know."

"All right," Brand said, with a regret equal to Gomez's. "Keep them pinned down till I get my men out of here."

Aides scurried away across the field, ducking low to avoid searching ray beams from the ships, and in a few minutes Brand saw the Venusian troops circling the field.

"At least, they've learned some discipline," he muttered to himself. "They're withdrawing in good order. We'll still be able to give Earth a fight for their money."

Returning to the woods, Brand took command of his battle-weary but angry army. The Venusians were far from licked, but all had the good sense to see that they were helpless in the present situation.

"We're not through," Brand told them. "We'll meet the enemy again, and trim them to a turn."

Gomez, at a nod from Brand, started withdrawing his guns. He needed no instructions. A full battery was left in position, to continue rapid fire until the main body was safely in the woods. The gunners could then save themselves—if they could. This was war.

Except for a steady grumbling from the men, the long march back to the edge of the swamp and the boats was made in silence. Behind them the guns continued to roar, but their harsh voices were growing weaker. Finally they died away altogether. Brand could not repress a shudder. He ordered a com-

pany of hard-bitten swamp runners to fall back and cover, in turn, the retreat of the artillerymen.

Vivian met them at the swamp. One look at Brand's face told him the story. He clapped a friendly arm around the young commander's shoulders.

"What the hell, Brand," he said. "No one can win all the time. It's the last battle that counts, and we haven't come to that yet."

Brand turned and looked back over the trees in the direction of Wallacetown. A heavy pall of black smoke, streaked with orange, hung in the sky. A pall too heavy to have come from the cannonading. Green, dogged, faithful and efficient to the last, had carried out his mission.

THERE was no cheering this time when Brand entered New Buffalo at the head of his troops. People regarded him with anger, or, what was worse, with contempt.

"The other side of the medal," he remarked glumly to Niki Willis, who had gone to the port to meet him.

"Don't take it so hard, Brand," the older man told him. "We know you did your best. You can't help it if the people had the idea the revolution was won and over with."

"I don't suppose your precious Council has taken the blame for stripping me of troops when I needed them the most." Brand's voice was bitter.

"You didn't expect that, did you? But I promise you things will be different from now on. I've been appointed secretary of war in Eihler's cabinet. I pull a lot of weight now and, between you and me, most of the councilmen are scared white."

Despite the Council's command to report to them at once, Brand took time to send his troops to the barracks, to satisfy himself the wounded were being cared for, and to make arrangements for replacements. When he finally appeared

in the Council chamber, he had fought down his bitterness and was hard and cold.

"I don't have to report all the details of our defeat to you," he began. "You should know them by heart by now. But I do want to reassure you that Torgunkluck will not share the fate of Arkgonactl, at least not for another month or so."

"Then all is not lost!" It was the delegate from Yakishikiki again.

"No. Thanks to Captain Jack Green and the men who died with him destroying the Wallacetown shipyards."

"Captain Green's act of heroism will not be forgotten," boomed President Eihler, who was quickly recovering his natural pomposity.

"Maybe not," Brand cut in, "but it will be useless unless we here and now decide how we're going to conduct future hostilities."

"It seems to me, general," purred a delegate from Golubhammon, "that you are a little premature in taking it upon yourself to offer advice to this body. After all, the troops who were defeated on Arkgonactl were under your command."

"In that case," Brand stormed, his cold self-control vanishing in a burst of fury, "here are my shoulder straps. Give them to one of your damned constituents, and see how long you can avoid the disintegration cells."

Angrily he ripped the badges of command from his blouse and flung them onto the council table. Half a dozen flushed councilmen leaped from their seats. Then Niki Willis' big fist crashed onto the table.

"Gentlemen," he roared.

"Yes, yes," President Eihler boomed. "Please, let us have order."

"Brand, you keep your shirt on," Willis barked, his thin, ascetic face equally flushed. "The rest of you gentlemen relax. This is no time for personal recriminations. The fate of our

planet—I won't mention our own skins—depends on us keeping cool now."

THE eighty-odd councilmen, suddenly sobered, sank back in their seats along the sides of the vast council table. Brand took a seat at the foot, next to Willis, who remained standing, his cold blue eyes searching every face.

"Personally," Willis resumed, "I think the less said about the defeat on Arkgonactl the better. Brand Martel, I know, nearly accomplished a miracle. He failed in his main purpose, I admit, but that was not his fault. And he has given us at least a month's respite."

"I think we would do better to use that time in preparation for a resumption of hostilities, rather than in personal recriminations. Brand, have you any suggestions?"

Brand rose slowly to his feet and rested his hands on the edge of the table. Again he had control of himself.

"I admit," he said, "that we lost on Arkgonactl. That's past. Let's forget it. The present situation is this: Earth has succeeded in landing a full army corps on Arkgonactl, at least sixty thousand men. But those men are virtual prisoners on the island until their commander has a fleet strong enough to enable him to move them over water."

"Admiral Vivian, with the five ships of the regular navy and half a dozen volunteer privateers, is blockading Arkgonactl. He will continue to do so until the new Earth fleet is launched."

"And then?" The councilman who posed the question spoke for all.

"By then the battleships we captured a month ago should be repaired and seaworthy. And a reasonable number of privateers should be outfitted to bring Vivian's strength up to that of the enemy."

"I see," President Eihler put in. "You propose a naval engagement, to maintain our control of the seas."

"Not exactly," Brand said. "That

wouldn't solve our whole problem. It would only draw it out. There would still remain the Earth army on Arkgonactl and the space fighters who have Venus blockaded outside the atmosphere."

"And that's something to consider," blurted a delegate from Golubhammon. "Here"—he slapped a pile of papers in front of him—"here are one day's protests from the businessmen of my colony. They can't ship their products. Their workers are idle. They're losing money every day."

"They may as well reconcile themselves to go on losing money, until the revolution is a complete success," Brand told him coldly.

"Just what is your plan, general?" another asked.

"You've heard of the ancient game of chess," Brand continued. "It is a battle of wits. Well, I want to match wits with the Earthly commander, only we'll be using men and ships for pawns. We haven't the brawn. We'll have to use brains."

"And meanwhile the Earthly troops overrun every archipelago on Venus."

"Gentlemen"—Brand was deadly serious now—"if you will give me a free hand, and your co-operation, I promise you not an Earthman will ever set foot in a Venusian colony."

THE MONTH was nearly up when Brand, again wearing his commander-in-chief's shoulder straps, sailed from Kardigan harbor with the army. This time there were no militia. Every one of the ten thousand soldiers in his command was a Venusian regular; and nine out of ten were battle-tested veterans.

Accompanying the convoy were the six rebuilt battlewagons captured from the now-defunct Corp. en route to join Vivian as part of the regular Venusian navy, and fifteen privateers.

The chess game had started.

After a feint at Arkgonactl, which in-

cluded a skirmish in the swamp south of Wallacetown, Brand withdrew into the center of the Blue Ocean. From spies and scouting cruisers, he kept an eye on the enemy's activity.

When the Earthly fleet, conveying some twoscore transports, appeared off the west coast of Janusking, Brand was ashore, waiting for the landing party. At Hikelungert the same thing happened. And at Yakishikiki.

Northward, always northward, moved the opposing forces. Wherever the Earthly commander turned, there he found the Venusian army waiting for him. At Martablaring he landed a division, then sailed south. The Venusian army was back at Janusking to greet him. He returned and only with great difficulty rescued his Marta force from the desolate archipelago on which it was stranded, cut off from the settled colonies by impassable swamps and from the sea by Vivian's cruisers.

Raids on isolated Venusian seaports by cruiser squadrons proved equally fruitless. In every case the raiders were repulsed by well-manned forts. The best the Earthly commander could do was to seize small, uninhabited islands outside the ports and maintain a semblance of blockade. But this required the services of half his available warships.

"Not bad so far," Brand remarked, when the situation was discussed at a council of war, in which the entire Provisional Council participated via television.

"But we're not getting anywhere," protested Brand's pet peeve, the fat delegate from Yakishikiki.

"You're not being disintegrated, either," Brand snapped back at him.

But at Golubhammon the tide turned in Earth's favor. The Earthmen effected a landing, the two armies engaged in a brief battle and the Venusians fled inland.

Hot on their heels across the culti-

vated barlon fields came the Earthmen. Again and again the Venusians reformed their lines, only to fall back after repulsing an attack or two.

"For God's sake, General Martel, put another brigade into the line," Brand's staff pleaded after a particularly bloody encounter.

"Order the men to fall back," Brand snapped. "The second, third and fourth brigades will cross the channel in back of us, and take up positions to cover the retreat of the first brigade."

This maneuver was effected, but there was considerable grumbling during the week's respite that followed, while the Earthly commander was consolidating his position and moving transports up through the swamp that separated him from the Venusians. Brand quickly put a stop to it.

"I'm conducting this campaign," he told them bluntly. "And I'm conducting it my own way. The Provisional Council has given me full authority. Any officer or man who disobeys an order will be shot."

"And bear in mind, while we have the enemy on our tails, they're far away from our homes and our wives and children."

WEEK AFTER WEEK passed and still the Venusians retreated through the vast, sprawling archipelago of Golubhammon, maintaining a constant rear-guard action with the pursuing Earthmen. Transports sent by Vivian removed the inhabitants of the towns in their path, except for those veterans who elected to throw in their lot with the army.

Thus matters stood when, just three months after the defeat at Arkgonactl, Brand sat on a table in a scantily furnished barlon picker's shanty in the wildest section of the archipelago and received a delegation of local businessmen from the town of Rakonton.

Brand was leaner than ever and his

eyes glowed dully when he spoke. His facial muscles twitched oftener now, and his fingers kept up a continual drumming on the table top. In this he was not unlike the rest of the veterans camped around the shanty, which bore over the lintel the scrawled notation, "Headquarters, Army of Venus." Three months of incessant warfare, three months of continual defeats, rasped on their bare nerves.

"We have, I believe, a legitimate complaint," voiced the chairman of the delegation.

Brand eyed him curiously. Here, he thought, is one man who has never missed a meal. Here is a man who has never been forced to forgo bathing in the vital, life-giving rays of an ultraviolet lamp for weeks on end, while calling on overtaxed muscles for still further efforts. That firm, pink flesh was never tempered by battle in the abysmal swamps. To think that there were still men, and women, too, like that on Venus!

"Do you realize, general," the man went on, "that we are faced with ruin? We haven't been able to ship a load of barlon to Earth since Congress sent those regulars to Venus. Our warehouses are bulging, and we can't pay the pickers."

"It's too bad you went to all that trouble," Brand said.

"What trouble?" asked another of the delegation, pinker even than the first spokesman.

"Filling your warehouses," Brand answered evenly.

"But what else could we do? As I said, we can't get a spaceship through the blockade. Those damped cruisers have been blasting every one of our vessels out of the ether."

"Because," Brand said wearily, "I am going to burn the warehouses."

A chorus of frightened yelps greeted this announcement, punctuated with demands for an explanation. Brand waited



*"They can't hit us with the screen up—but we can't hit them!"
Brand exclaimed. "Drop the screen for just a minute and—"*

until the noise subsided.

"An enemy flotilla is headed this way. They know our position. We could, I suppose, stay here and fight them. But that's not my plan. I'm going to retreat farther into the swamp. And I'm not going to leave a fortune in burlon for the enemy. Is that clear?"

"That may be your plan, general," the spokesman said. "But we think differently. We have about made up our minds to open negotiations with the congressional representatives on Arkgonactl. With this burlon as our ace in the hole, we believe we can come to agreeable terms with them."

"I don't doubt that you could," Brand said. "Agreeable to them, that is. But you won't. That burlon burns before we leave here."

"We'll protest to the Provisional Council."

"Protest and be damned. The Council dumped the responsibility for conducting the war on my shoulders and I'm going to conduct it my way. I've already sent a squad to fire the warehouses. Any interference with them will mean death to the one who interferes. And what's more, I'm going to clean Rakonton of food and supplies."

"But . . . but what will become of us?"

"If there are any men in Rakonton, they can join the army and eat. The rest of you can beg your meals from the Earthmen. I've arranged to evacuate the women and children. There are transports waiting to take them to Tortukluck."

"You've already nearly depopulated Golubhammon," howled a fat food merchant. "Why, there are hardly enough persons left in Rakonton even to justify my keeping my store open."

"Exactly," Brand said. "Well, that'll be all, gentlemen."

TWO grinning guards escorted the delegation outside, where their injured

outcries afforded considerable amusement to the soldiers. Having already lost everything but their lives, and knowing that they might lose them any minute, they were in a position to appreciate the grim humor of the merchants' predicament.

"You're not very popular around here, general," commented an unshaven major whose tattered uniform alone served as campaign ribbons.

"I never expected to be," Brand responded. "But let's get down to business. What's the latest information on the enemy's disposition?"

"The flotilla you mentioned is standing off and on down the coast. Apparently waiting for orders—or information. Five fast cruisers, new type."

"No transports with them?"

"None, sir."

"Hm-m-m," Brand said. "Must be just a scouting force. Well, go on."

"The main Earth army, comprising four full divisions of regulars, and a mixed division of Corp troops and Arkon loyalists, is on transports anchored in the Bay of Hamilton. Field Marshal John Gumpertz has direct command of them. I believe the Corp artillery is attached to this force."

"The convoy is guarded by three squadrons of cruisers, all new types shipped from Earth. They haven't any battleships."

"Those are the boys we'll have to deal with," Brand said. "In a way, it's a break Gumpertz has them concentrated. That'll keep them out of mischief elsewhere."

"Gumpertz left his fifth division to hold Arkgonactl."

"Yes, I know. He isn't taking any more chances of a surprise attack on his base. Well, that doesn't handicap us any right now. How are things going on the water?"

"Admiral Vivian said he'd report to you at six o'clock. It's almost time now."

Brand glanced at a clock on the wall, then switched on a portable television report screen set up in a corner. A few minutes passed, then Vivian's grizzled face, the black beard beginning to show streaks of gray, appeared.

"Hello, Brand," the indomitable old warrior saluted. "How's tricks with you?"

"We're going along in our own quaint way." The older man's gruff familiarity never failed to bring a smile to the harassed young general's lips.

"Well," the admiral went on, "I'm still carrying out your orders. Two of the battleships sank a transport and a cruiser escort this morning off Yakishiki. The rest of the fleet is scattered all over the Blue Ocean. We're keeping Gumpertz's ship captains on the jump.—They haven't even had time to think of raiding any of the main islands."

"Good," Brand said. "They're still blocking the principal ports, though?"

"Yeah. I don't see why you make me let them. Hell, we could blow them right off that itty-bitsy island they've captured outside Kardigan port in a few minutes."

"No, don't do anything like that, Vivian," Brand said. "You base on the army here. Let them go on thinking this is the only base you've got."

"I don't get it," the admiral growled.

"You will. And soon, I hope. In the meantime, keep on pestering enemy convoys. But keep your ships within concentration distance."

"You mean we're going into real action?"

"I hope. Good-by. Keep in touch with me. I'm drawing back farther into the archipelago here."

Brand turned to his acting chief of staff, a keen-eyed young general named Crump, who was doing his best to fill Jack Green's shoes.

"Have the men prepare to march," he ordered. "Pick up the supply trams as we pass through Rakonton. We'll

use the rail line as long as possible. And don't forget to destroy it after us."

Crump saluted and went outside. Brand turned to one of the ever-present maps and ran his forefinger over the northern section of the Golubhammon archipelago.

"Ideal," he said softly to himself. "If Gumpertz only sees it the way I hope he will."

THE tramp, tramp of thousands of feet took him to the door and he watched his army file past. There were some eight thousand of them, nearly all riflemen and all veterans. The scholarly Gomez, looking out of place in that rough army, trudged past at the head of his artillery, a conglomeration of field guns and mortars of all ages, sizes and descriptions. Brand never ceased to wonder where and how that incredible old artilleryist found his weapons. He always seemed to have full batteries on hand, despite heavy losses and overuse.

But the young commander's principal attention was taken by his newly formed cavalry regiment. Some six hundred of the toughest fighters in the army had been mounted on half-broken teufels—great, grotesque, web-footed, wingless birds discovered on Golubhammon and aptly named by an early Teutonic explorer.

It was a hobby with the Golubs to capture these frightful swamp birds soon after they broke from their eggs and break them as mounts. They could run better than sixty kilometers an hour on their sprinting, flapping feet, which also served to propel them swiftly through the swamp waters and support them on muck.

Brand smiled as the troopers struggled to force the evil-tempered birds into some semblance of marching order. He knew plenty of curses were being showered on his head for conceiving the idea of such outré cavalry, but he foresaw a use for the force.

Leaving the headquarters orderlies to break camp, he strode ahead to the advance guard. A few minutes later they entered the small city of Rakonton, northernmost of the colonies. The place seemed deserted. Houses and stores were empty. Along the artificial channel huge warehouses burned and belched heavy smoke skyward. Brand nodded approvingly at this. There was more than destruction in his mind. That smoke was a beckoning finger to Gumpertz. He knew the Earthly commander was being lashed by Congress because the wealth of Venus was trickling so slowly back to Earth. And he knew Gumpertz had counted on seizing the year's crop of Golubhammon burton to satisfy his superiors.

Through the town and into the swamp again pushed the long column. Causeways had been constructed along here to carry the monorail tracks, and the troops followed this route. They would have enough plain swamp travel before they were through.

Except for the grunting of the laden soldiers and an occasional barked order, the first five kilometers were covered in silence. The causeway ended suddenly on a small, flat island, the jumping-off place into the swamp. The advance guard debouched onto the island, dropped their packs and squatted on the ground to rest.

Then all hell broke loose. From every side, scaly, flat-snouted heads broke through the scum-covered water. Snake-like arms churned the surface into a green froth and the light glittered on the metal barrels of hundreds of heavy carbines. Ringing reports sounded, and the Venusians, caught off guard, began to fall.

Brand's hat was whipped from his head by a bullet as he plunged forward.

"Take cover," he bellowed. "Behind your packs! Form firing lines!"

Instinctively the veterans obeyed. Wriggling into position, they returned

the fire of the Krokols. Heads began to disappear, torn to pulp by the high-powered slugs. But the aborigines, with a saurian's disregard for death, continued to advance on the island.

"Rapid fire!" Brand barked.

"Tain't much use, general," gasped a bearded rifleman at Brand's elbow. "Them damn Krokols duck under the surface and then pop up right in front of you. Where in hell'd they get so many guns?"

Brand knew the answer to that, and it turned his stomach. It was something he never dreamed even a ruthless commander like Gumpertz would sink to. To furnish arms to the fiendish Krokols. Even with their own primitive weapons, they had held the Venusian colonists at bay for more than two hundred years. In his mind's eye, Brand could see the hundreds of isolated communities and farms falling-prey to the vicious saurians. The same thought, he knew, was running through the minds of the other men.

HE LOOKED back along the causeway. It was covered with still, mangled forms, some wearing the green uniform of the army, but more clothed only in glistening scales. Farther back, Venusians lined both sides and kept up a steady fire on the swamp. A brighter glint of metal flashed behind them.

"Some of Gomez's mortars," flashed through Brand's mind. "But what does he expect to do with them?"

He was answered almost immediately. A series of shells rose into the air and burst deep in the murky water along the nickel framework of the causeway. Green bodies, some limp, more burst open, appeared on the surface. Another volley dropped into the scum-covered water, and still more bodies floated to the surface. The firing died away.

"I get it!" Brand exclaimed. "The concussion is killing them. Like the stories of dynamiting fish on Earth I

used to read. Leave it to Gomez to think of something like that. He'd find a use for artillery in church."

The menace removed, reserve troops dashed along the causeway and added their fire to that of the small group on the island. The crocodilian heads vanished together, but this time they reappeared farther out. The Krokols were retreating as fast as they could swim.

"That's funny!" a rifleman exclaimed. "They're heading right for the open sea. You can see it through that break in the trees yonder."

Brand looked. The man was right. The Krokols were swimming toward open water, to certain death in the rapacious jaws of the monsters of the deep.

Then the five Earth cruisers that had been hovering off the coast drifted into view between the trees and supplied an answer.

The glistening green heads of the fleeing Krokols were plain on the flat blue water. They were swimming straight for the cruisers. Some of the men continued to fire, taking careful aim and scoring hit after hit. They, like the others, were thin-lipped with cold rage. Their faces boded ill for the enemy when and if the latter ever came within range.

In his vindictive determination to crush the rebellion, Marshal Gumpertz had committed the one unforgivable crime on Venus. He had arped the savage Krokols and turned them loose on the helpless inhabitants—for the saurians were too wary to battle armed men if they had a choice.

"Venus won't forget this," Brand gritted between his teeth. "The whole planet will be in arms now. The damned, money-grubbing politicians in Congress have finally overstepped themselves. If only it isn't too late! But it can't be."

The army was reforming. Soldiers carried the bodies of their fallen comrades to the center of the little island

and laid them in a pile, interspersed with thermite bombs. The dead Krokols were flung to the greedy, scavenging denizens of the swamp, already feasting in the bloodied waters. When the tail of the column jumped off into the swamp, the rear guard touched off the thermite and the bodies disappeared in the clean, white heat. It was a better funeral, perhaps, than they would get themselves.

NORTHWARD, always northward, Brand led the warriors of Venus. Still the vast, mysterious swamp lay ahead of them, as it lay now behind them, and on either hand. Even the staff officers could see no reason in this forced and laborious and always dangerous march. But Brand quieted them with a scowl.

Now and then a runner caught up with the column, reported to Brand and disappeared again in the swamp. Every hour a television screen was set up by the engineers and Brand talked to Vivian, to Niki Willis, to other commanders scattered over the face of the planet. Once he held a long private conversation with the worried Provisional Council.

Finally, summoning his staff officers and the battalion commanders, Brand unrolled a new but crude map.

"This is our present position," he pointed out, stabbing a circled kidney-shaped blot of land in the green representation of the swamp. "We're way up in the north of the archipelago. But, what's more important, Gumpertz and his whole army are right on our tails. They followed the coast, then worked through this channel here. We crossed it yesterday."

"Will you please tell us, general, what in hell is the big idea?" snapped a wearied colonel. "My men have marched their legs off, and we've had casualties every day in this damned wilderness."

"The idea," Brand snapped back, "is

to draw Gumpertz away from his base on Arkgonactl. To draw him up here in the swamp, where he'll be handicapped by his sheer numbers, and where one of our men will be worth a squad of his Earth soldiers."

"What if he figures that out, too, and goes back? And leaves us marooned up here?"

"He probably has figured it out by now, but he can't do anything about it but fight. He can't do anything on Venus while we have a strong, well-equipped veteran fighting force, and command of the seas. And we have that."

"No, gentlemen. Marshal Gumpertz has got to fight, and now. He'll never again catch us in a position like this, where we have to fight, too. And he knows it. He's got the greater army, and a fair number of cruisers. But his only hope is to destroy us on land and bar the navy from its bases until it scatters or surrenders."

"But, good Lord, general, you're gambling the fate of Venus on a single battle. And on a battle where we're outnumbered seven to one." The colonel was agast.

"I know it," Brand told them. "I know it as well, if not better, than you do. But it's our only chance. Already many of the Venusians, those with businesses and property, are tired of the war. We can't carry on without their support. And it's next to impossible to get the militia to fight off their own archipelagoes. After seeing those Krokols I don't blame them. They've got homes and wives and children to protect."

"If we have to fight this way, well, we'll do it," a battalion commander put in. "But I tell you, general, it's against reason."

"Are you going to attack, or let Gumpertz make the first move?" the colonel asked.

"I want him to attack," Brand said. "But we may have to prod him a little.

We're going on to the east end of this island. It's big enough in back of us to let us maneuver, and narrow enough in front of us to keep Gumpertz from outflanking us. He'll never maneuver those Earth soldiers in the swamp."

"No, but he's got Krokols."

"I'm not forgetting them. I hope he uses them. The more of those reptiles the boys kill now, the fewer we'll have to exterminate later."

"One other question." It was the major again. "Is there any chance of our getting reinforcements?"

"Yes. Admiral Vivian has instructions to pick the garrisons of Torgutkluck, Yakishikiki and Martablancing, and as many veteran militiamen as will volunteer. He should bring us several thousand men."

"Now move your men to the other end of the island and dig in. The channel ends some distance away, so you'll be out of range of the cruisers' ray guns."

AS BRAND had said, the island, which he chose from a little-known survey map made only the year before, was ideal from the viewpoint of a small defending force. It was irregular in contour, with rolling hills, densely wooded. The swamp, however, encroached on all sides, thus effectively screening an attack. But the Venusian outposts would take care of that.

To the east were a number of smaller islands, which Gumpertz had undoubtedly already seized. But they were separated from the main island by from a half to five kilometers of swamp.

The sound of firing marked the arrival of the first contingent at the end of the island. Brand and his staff hurried forward on squawking teufels borrowed from the cavalry. The Venusians were stretched across the comparatively narrow stretch of land in a ragged skirmish line, and were firing steadily as

Continued on page 152

How Scientific Scalp Treatments ENCOURAGE HAIR GROWTH



1 You, who are worried because of excessive falling hair and receding hairline, will be interested in the story on this page which is published through the courtesy of the Vitar Hair Institute, 551 Fifth Avenue, New York. Below you will find pictures showing how subjects are treated in an effort to encourage hair growth.

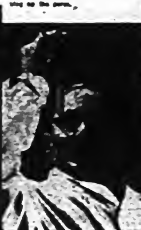


3 Here you see a trained scalp expert analyzing VITEX'S TRIPLE ACTION CONDITIONER. An intermittent current and massage is used to induce increased circulation to necessary for the hair roots. Chesterton is a necessary requisite for uninterrupted hair growth. Vitar's Chesterton contains precious ingredients that clean, stimulate and help partly . . . it is essential that each dirt can settle in the hair and cause and stay on the scalp.

4 Now the subject feels the tingling effect of electrolysis and also knows that VITEX'S TRIPLE ACTION CONDITIONER is really at work. VITEX HAIR INSTITUTE has prepared its latest products so that everyone can see them at home and enjoy their benefits. So easy to use . . . no attendance is necessary for result getting applications.



2 A microscopic examination of your hair would probably reveal that there are foreign agents attacking and stopping up hair growth process and interfering with natural hair growth. In many cases patients, through the use of electrolysis, have been able to correct this condition by encouraging increased circulation, causing a clearing state of increased blood circulation and thereby giving the roots to breathe and function naturally without interruption.



5 & 6 Here's a laboratory photo of Vitar Hair Institute's chemical analyzing the precious ingredients which are used in VITEX'S Hair Reconditioning Method. Those who underestimate the actual and scientific value of a healthy head of hair, should know there are fourteen vital causes of Baldness . . . thirty years' experimenting, study of research and application have now made it possible to present readers of this magazine with a scientific and that has proved itself to be very helpful.



Continued from page 149

they advanced from tree to stone, and from stone to brush.

Scattered over the rolling slope were glistening green bodies, interspersed with blue-clad figures. None moved.

"Good," Brand said. "This will tell Gumpertz we're here. It's his move now."

He nodded to the colonel of the cavalry and the mounted men dashed forward on their ungainly, two-legged steeds, howling fiercely and swinging six-foot, razor-sharp blades. The mere sight of them was enough for the Krokol irregulars, who broke and waddled hastily toward the shelter of the swamp. The regulars, although startled by this terrible cavalry, rallied and stood their ground.

But neither profited. The cavalry rode over the khaki line and cut down the fleeing Krokols as they ran. The long blades bent and whined in the air as the Venusians chopped right and left. Those who escaped the steel were beheaded by the snapping twenty-inch bills of the fierce war birds. In a few minutes the slope was clear.

"We'll dig in along this ridge," Brand told his senior engineer. "That way Gumpertz will have to attack up the slope, and that's half a kilometer if it's a handbreadth."

"If he doesn't outflank us, after all. We'll be in the soup then." It was the suspicious colonel again.

"You don't know this particular swamp, colonel," Brand said with a smile. "Come with me a minute."

They picked their way down the slope at the end of the ridge and came to the tall rushes that marked the edge of the swamp.

"Smell anything, colonel?" Brand asked.

The other sniffed several times. "Tar," he said.

"That's right. Now look." Brand pushed aside the rushes and disclosed a

shiny, ebony pool. Other pools reflected the filtered light beyond the swamp trees.

"These pits are almost bottomless," Brand said. "They stretch for miles on either side of the island. I only learned about them myself the other day. I doubt if Gumpertz's men have discovered them yet. But one thing is certain: no big body of troops is going to encircle us. An insect couldn't cross one of those pools without being sucked down."

"Gumpertz might still pull out when he finds what he's up against."

THE WORK of fortification continued. Along the ridge the engineers dug a deep trench, complete with embrasures for the riflemen. Behind them Gomez happily superintended the construction of gun emplacements.

Other engineers were busy erecting tall masts along both sides of the island up to the trench, and stretching cables from them back to the interior.

"All ready, sir," the senior engineer reported to Brand just before sunset. "The atomic converters and generators are running smoothly. We've got enough current to stop a spaceship."

Brand summoned Gomez and gave him some instructions. The latter was patently puzzled, but had served through too many campaigns with the young general to question him.

He collected a mortar crew and moved the weapon down the slope away from the trench. Brand waved and the mortar belched forth a heavy shell which curved through the air and fell straight toward the trench.

Soldiers, attracted by this curious maneuver, instantly hurled themselves to the ground and sought to merge their bodies with the earth. But the shell never reached the trench. A hundred meters above the ground, at the level of the top of the masts, it exploded with a mighty blast.

Brand and the senior engineer looked pleased. Other officers, puzzled, scratched their heads. Gomez, equally bewildered, returned and looked inquiringly at Brand.

"It's an electric screen," the latter explained. "Holbrook here was working on the principle in the university when the revolution started. There's an impenetrable screen stretched across our position from the tops of those masts. No shell can go through it."

"Why," Gomez gasped, "that'll make artillery absolutely useless in the future."

"Just so it makes Gumpertz's useless right now is all I ask," Brand retorted. He walked away, leaving Gomez staring despairingly at the tops of the masts.

Glancing over his shoulder five minutes later, he saw the veteran artilleryman hadn't changed his posture by the flicker of a muscle. The same dazed expression was on his face.

"Poor Gomez," Brand thought. "He's either contemplating suicide or trying to figure out a shell that will go through Holbrook's contraption. He must be in love with those damned noisy guns of his. No wonder his wife left him."

He glanced at his watch and switched on the televisior at the makeshift headquarters. In a few minutes he was talking to Vivian.

"Well, I carried out your orders, Brand," the other said. "I'm a hundred kilometers off the coast of the swamp, right opposite the entrance to the channel Gumpertz used. I've got six transports loaded to the gunwales with troops. How am I going to get them to you?"

"Never mind that now. How are things on the other archipelagoes?"

"The same. The inhabitants are afraid to try to leave and the enemy detachments guarding the ports aren't strong enough to attack them."

"Good. That means the war will be settled here."

"Yeah. It's a break for the noncom-

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appeared along the shore.

The Venusians working there dropped their tools, caught up their rifles and opened fire. But the Krokols, having the advantage of surprise, swept them back. As soon as the shore was clear, a dozen power canoes grounded and from them poured a full platoon of Earthly infantry.

"Good God!" Brand exclaimed. "Holbrook, call headquarters for reinforcements."

He himself plunged into the thick of the fray and rallied the Venusians. The latter were outnumbered, but being stubborn fighters, they took shelter and refused to give ground further. They were barely holding their own, however, when a squadron of cavalry swooped down the hill and routed the invaders.

"Anyway, I've learned something," Brand remarked to Crump a little later. "This devil cavalry is ideal for guarding the shores. The six hundred of them can do more than a couple of thousand infantrymen. And you can bet that when Gumpertz attacks, his Krokols will be buzzing along every inch of the shore."

"I'll assign them to that duty, then, sir."

"Better assign a battalion of riflemen to operate with them. If the Krokols do succeed in landing some place in force, the infantry can take care of them and leave the cavalry free for patrol duty."

Brand had counted on at least a week to prepare for the impending attack, figuring that Gumpertz would take that long to sound out their relative positions. But the veteran marshal was an experienced man. He sized up the situation at once, undoubtedly cursed himself for being thus outmaneuvered, and immediately launched an offensive.

The attack started just before dawn. Brand's vedette posts vanished in the flood of armed men, but not before they

had warned the main body. The necessity of moving thousands of men through the swamp in small boats handicapped Gumpertz, but the impenetrable vegetation protected him from the Venusian fire.

"Let me throw just a few mortar shells into that swamp," Gomez, tagging after the ubiquitous commander, begged.

"Not now," Brand said. "You'd only be wasting ammunition, and besides I want Gumpertz to move his men up here, where I can get at them."

He did, however, send a line of skirmishers into the swamp to engage the vanguard of the attackers. He was faced with a delicate problem. Everything depended on his drawing Gumpertz into battle while conditions favored the Venusians, and to do this he had to let the Earthly commander have the advantage of odds. But Gumpertz might grow too suspicious and merely stand pat, in which case both would be stalemated and the revolution would die of inertia. On the other hand—but he refused to entertain that possibility.

THE JINGLE of equipment and now and then a muttered curse came from the trenches as the Venusians moved into position. Excellent shots all, this, to them, would be like small boys peppering a bronto with bean shooters. But—always that but—there were so many of the enemy.

"The ancient English did it at Agincourt, the Americans did it at New Orleans and the Germans and Turks did it at the Dardanelles," Brand told himself, in an effort to draw encouragement from history. "And with aircraft eliminated, we're in the same position."

"Well, sir, this will be the test of your theory," Crump remarked to him. "I confess, after we were chased off Arkgonact, I thought we were through. And letting the Earthlings lick us in every little engagement the past three

months, well, I must admit, sir, I began to have my doubts."

"Of me?"

"That's it. But now I can see what you were aiming at."

Brand felt unaccountably relieved. He had been worried, all those months he was encouraging Gumpertz to chase him into the swamps. Anything might have gone wrong, and the responsibility was his alone. But, looking back, he couldn't think of any other strategy that would have accomplished his purpose so quickly.

There was little time left for reflection. Already the skirmishers were emerging from the swamp and racing up the slope. Behind them appeared a line of blue, standing out darkly against the pale-green foliage. The sky in the east was faintly pink.

"Be light enough for good shooting pretty soon," remarked a rifleman, squinting over his sights. "Bet I could knock off a couple of those blue uniforms right now."

"No shooting till I give the order," Brand barked. "Pass that along."

Faint *sprangs* sounded in the stillness in back of them.

"Harrington's cavalry seems to be in it already," Crump said.

"I expected that," Brand told him. "Naturally Gumpertz would open his diversion first. But our cavalry has spoked that maneuver, whether he knows it or not."

The blue line at the base of the hill thickened as the light grew stronger. The watchers, half a kilometer up the slope, could see streams of men breaking through the rush border of the swamp.

"He's emptying his boats and sending them back for more," Brand decided. "It'll be an attack in force all right."

"We're ready," Crump said confidently.

"Too bad we haven't got Vivian and

Dorgan and their men with us. But they're playing their part at the other end of the channel."

Crump looked up expectantly, but Brand did not bother to explain further.

THE WAITING Venusians, never overly patient, were making remarks and cracking bad jokes all up and down the line. Brand went down the trench, slapping a back here, putting in an encouraging word there. It was easier than it had been at Granagon. Half a year of steady warfare had impressed the veterans with the need for discipline and order.

"We can expect a bombardment," Brand told his captains, "but we needn't worry about it. Holbrook's screen will stop any mortar shells, and we're dug in enough so their field guns can't reach us."

"Gumpertz will probably move his first two or three waves up within a hundred meters of us by squad rushes. I want only every fifth man to fire at them. No sense betraying our strength at the outset. When the main attack comes, have half your men fire at the attackers in front of them. The rest concentrate on the reserves farther down the hill."

"Remember, our only chance of winning—and this battle means the whole revolution—is to inflict as many casualties as possible. That's why I'm letting the enemy gang up out there."

All saw the import behind this reasoning. The Venusians were shrewd as well as brave. They had to be to live on the savage planet. But it was becoming increasingly difficult to restrain the men. In no age or country have soldiers enjoyed waiting while the enemy went about the business of preparing to exterminate them.

But Gumpertz could not afford to delay long, or he would sacrifice the only advantage he had—that of poor light which would minimize the accuracy of

the Venusian fire. Half an hour after the first troops landed, three waves started up the hill.

"Remember," Brand cautioned. "Let them come within a hundred meters. Those waves aren't strong enough to take us, and there will be other targets behind them."

Men shifted nervously from one foot to the other and knuckles grew white against the dull beryllium barrels. The steady advantage of the Earthly infantry never faltered. They were still walking with long, loping strides, their bayoneted carbines at the carry. Crack troops, those.

"Saving their strength for the final rush," Crump commented, eying the line. "Damn little good it'll do them. Those boys are doomed, and they know it."

"Sure," Brand said. "But automa-tions don't think too much."

Other waves formed and crawled up the hill, one after the other, until the lower half of the slope was covered with blue-uniformed figures, hazy in the pinkish light.

"Now!" Brand shouted as the first wave broke into a run. "Give them hell, boys! Fire at will, but aim! Aim!"

Rifles changed the full length of the trench. The ringing reports were deaf-ening, and Brand had to look twice be-fore he was satisfied only a fifth of the men were firing. He looked back over the parapet. A full half of the first three waves were sprawled on the ground—and the survivors hadn't cov-

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separated them from the trench. Even as he watched, they, too, pitched forward, twitched once or twice, and were still.

Wave after wave charged up the slope, and went down under that terrible, accurate fire. Then the blue-uniformed men halted, wavered a moment, and turned and ran. Whistles sounded behind the parapet and the firing died away.

"Well, that's that," Brand said. He glanced at his watch. Barely three minutes had passed since his men opened fire.

"They seem to be digging in down there," Grimp pointed out.

Brand looked. Little clads of earth were popping into the air at the foot of the hill, falling back to form a rapidly growing embankment.

"They should have thought of that first," he commented. "However, we needn't worry about it. This won't degenerate into long-drawn-out trench warfare."

THE VENUSIANS were laughing now and cheering each other. Brand smiled grimly. Let them cheer, he thought. There's plenty ahead of them. That first attack was only a tentative feeling out of their line. Grimperts hadn't even started his offensive. Again Brand mentally congratulated himself on cutting his fire power to twenty percent.

A succession of explosions overhead turned all eyes upward. The air was fleecy with smoke and punctuated with orange explosions. Metal fragments rained down on the trench and the reverse slope behind them. Several men collapsed as the heavy fragments struck them.

"Damnation!" Brand swore. "I should have thought of that. Here, start those men digging dugouts. Shallow ones will do. Just get them under some cover."

He himself remained in the open, supervising the work, until his collarbone

snapped as a big chunk of iron glanced off his shoulder. Gump dragged him into an improvised shelter.

"This would have to happen now," Brand gritted. "Just strap it in place. I haven't time to nurse it."

Other shells whizzed harmlessly overhead and the bombardment was intensified. The Earthly gunners, perplexed at first, had quickly caught on to the principle of the screen and were throwing solid shells from their mortars. These dropped with monotonous regularity into the trench, drawing curses from everyone but Gomez. He was smiling for the first time in two days.

"One thing is certain," Brand said. "They can't keep that up forever. Gomez, why in hell aren't you replying to their fire?"

The little artilleryman pointed to the screen masts.

"They can't drop H. E. through that," he pointed out, "and I can't push it through from underneath. The thing works both ways. And it would be suicide to try to bring field guns where they would bear in the face of this barrage."

"Well, use solid shot in your mortars."

"Haven't any," Gomez upheld. "Who'd think anything like this would happen? Nobody ever tells me anything."

The barrage continued for an hour, then suddenly ceased.

"Come on!" Brand shouted. "Get your men up on the firing steps!"

Cheered by the opportunity to get in another lick at the enemy, the Venusians leaped to their posts. The blue waves were coming up the slope again, but this time they were closer together and nearer the top, having advanced under the curtain of their barrage.

"All guns!" Brand ordered. "Rapid fire! This is the real thing."

Again the murderous hammering broke out along the trench. At that close range every shot told. Wave after wave rained, but still they came on. At a quick estimate, Brand put the number of shock troops on the slope at over ten thousand. A full division.

But the casualties they were suffering were too heavy to bear. Whole companies went down at a single volley. The green carpet of the slope was covered with twisted blue figures. Along a line a hundred meters from the trench the dead were piled four and five deep.

Brand was the first to see the danger in this. The Venusians' unbearably murderous fire was bringing its own reaction. Earthmen, unable to approach that deadly firing line, were taking shelter behind the bodies of their fallen comrades. The pile of dead became an enemy parapet, heavily manned and too close for comfort. The Earthmen had opened fire themselves now, and Venusians, exposing themselves recklessly, were falling by the score.

A T. A. L. periscope, hastily rigged by the engineers, gave Brand a quick view of the field before it was shattered by an Earth boiler. That one glance was enough. Gumpert, seeing the immediate advantage of the situation, was moving two more divisions up the slope. The men were massed in an almost solid body. Their sheer weight threatened to roll the Venusian defenses flat.

"Gomez," Brand roared. "Get your mortars into action. Shell hell out of that hold! Quick! Hold back, switch off that damned screen so our own artillery can operate."

Curious himself for not thinking of this before, the eager little artilleryman sprinted back to his battery line, behind the crest of the hill. The gunners were only too anxious for action, and it was only a matter of seconds before they

were raining high explosives on the massed troops.

Another periscope showed Brand the ghastly havoc the shells were wreaking. Ten squads at a time were blown to bits. The Earthmen had no shelter. Mashed as they were, they could not even flatten themselves on the ground. It was too much for Brand. He hastily looked away, feeling sick at his stomach.

But there was little time for thought. Human nature, even when nearly obliterated by the rigid Earthly army training, could not long stand such carnage. On their own volition the Earthly infantrymen were flinging themselves on the Venusian position, charging madly into that deadly fire to escape the even worse destruction behind them.

Desperately, frantically the Venusians mowed them down. They did not have to be told that they would be overwhelmed by that human flood if they relaxed even for an instant. As it was, a small but growing number of Earthmen were succeeding in reaching and jumping into the trench, where they were instantly pistolled by the Venusian officers. But the red rage of battle inspired others to take their places.

On either wing of the slope, however, men were abandoning the fight and leaping into the swamps, preferring the unknown terrors of those miasmic stretches and the traps of the tar pits to the certain death that awaited them on the island. But for those in the center there was no choice. They died.

"It takes a long time, a terribly long time, to kill forty thousand men," was the thought that ran continually through Brand's head. Fortunately for him, and the rest of the Venusians, their actions needed to be only automatic. Had they been forced to think consciously of what they were doing, their minds would have snapped. Brand realized that long afterward.

The minutes dragged on, each an eternity. Finally the firing died away.

There simply wasn't an Earthman left alive to shoot at. Brand forced himself to look again. The fine, green grass that had carpeted the slope was completely invisible. The torn, mangled corpses of the three divisions formed a solid blue floor from the trench at the crest of the hill to the swamp at the foot.

The silence was stifling. Brand stumbled back out of the trench and was sick. When he looked up again, he saw he was not alone. Every man in that Venusian force was mentally scarred for life. There were no cheers, no laughter. Only mute, awed faces. They still scarcely realized the slaughter they had committed, but the awful, unconscious awareness of it, Brand knew then, would be with them for life.

It was impossible to keep the men in the trench any longer, and Brand did not care to try. They crawled wearily over the crest and collapsed from sheer exhaustion. Brand forced himself to go to his headquarters shack. The war was still on, and he was the commander in chief.

A FEW QUICK drinks of the fiery Venusian brandy brought him to and he switched on the television to communicate with Vivian. The latter was patently eager for news of the battle, the sound of which had carried over the forty miles of swamp to the besieging fleet.

"Gumpertz gambled and lost," Brand told him. "We wiped out three full divisions, to the last man, and God only knows how many were killed in the swamp skirmishes. I haven't gotten all the reports myself."

"Three of their cruisers tried to break through," the sailor said. "We blasted two out of the water. The other one escaped back up the channel."

"Stay there for the time being. I'll call you back. I don't think there'll be any more fighting on Venus."

Harrington entered the shack, grin-

ning. His fighting, Brand thought, must have been human, at least.

"The cavalry has been at the gallop—if you can call it that—since before dawn," he said. "The Earthmen and Krokols tried to sneak ashore all along the line. I still don't see how they got so many men through the tar pits. They must have been moving them up for two days."

"I take it you were successful."

"And how! The shore is lined with bodies. A couple of thousand of them. Mostly Krokols. The boys enjoyed killing them."

"For God's sake, don't talk to me of killing," Brand begged. "I'm sick now. Go take a look at that hill yonder."

"We took quite a few prisoners," Harrington went on. "They told us Gumpertz has been having trouble with his loyalist division. They mutinied when they learned he was arming the Krokols—the Corp soldiers, too. They've been on Venus long enough to realize what it meant."

"Harrington," Brand said suddenly, "I'm going to call Gumpertz. He's washed up, through. He'll listen to any terms. He has to, now."

Brand turned to the television and twisted the frequency dial. It took him several minutes to find the wave length the Earth forces were using, and several more to attract the attention of their headquarters. Finally a handsome but sullen face appeared in the screen.



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Brand noted the man was wearing the shoulder straps of a staff captain.

"This is General Brand Martel, commanding the Venusian army," he told the Earth captain. "Call Marshal Gumpertz to the television."

"Very well," the other smiled. "The marshal is right here."

Gumpertz's heavy, red face appeared in the screen. His mouth drooped despite his obvious effort to control himself. His eyes were bloodshot and he had some difficulty in speaking.

"Yes," he said finally. "I can guess what you're going to say, general. Go ahead."

"There has been enough bloodshed," Brand said. "It would be not only foolish but criminal to continue fighting. I know your position. You're stuck out there in the swamps. Half your command is starving. You know now you can't break through our defenses even if you could get your men to attack again. Your fleet is useless. Admiral Vivian has the mouth of the channel blocked."

"Go on," Gumpertz said quietly. "I acknowledge all that. What terms do you offer?"

"I'm not going to be harsh," Brand said. "Vindictiveness is not a Venusian trait. All we on Venus want, all we ever wanted, is freedom from Earth. Independence."

"I want you to surrender your forces, land and sea both. Here and everywhere else on Venus. We will guarantee you and your men passage to Earth. There will be no reprisals."

Gumpertz bowed his head a moment, then raised it and looked Brand in the eye.

"That is fair enough," he said. "I surrender on your terms. There is nothing else I can do."

"Good," Brand said. "Will you assign a detachment of officers to meet with mine and work out a formal treaty? We will sign it tonight, here."

ALL VENUS tuned in that night on the television projection set up by the engineers in the rude Venusian army headquarters on what was already termed Bloody Island.

Marshal Gumpertz and his staff, resplendent in blue and gold full-dress uniforms, lined up on one side of the small room. Opposite them stood Brand and the Venusians, ragged and unkempt by comparison, but with quiet satisfaction in their faces.

"Will you sign, marshal?" Brand asked, offering a pen to the Earthman.

Gumpertz glanced along the line of cold-eyed Venusians and shrugged his shoulders. He signed his name with a flourish and stepped back. Brand took the pen and signed the document.

ANOTHER three months passed before Brand Martel returned to his native colony of Arkgonath, this time as first President of the Federated States of Venus. Slipping away from his guard of honor and the crowd that gathered at the dock to greet him, he entered the city alone.

Then, still alone and still unnoticed in the crowds, he made his way to the towering building that housed the offices of Martel & Son. He entered the private office through the back way, hoping to surprise his father where he had bade him farewell nearly a year before.

But the office was filled with gesticulating men, Earthmen. They surrounded the elder Martel and waved fists under his nose. For a moment Brand's own fists clenched and his jaw muscles jumped nervously. Then he relaxed and smiled.

"For the last time," John Martel thundered, "I tell you I'm setting the prices on raw barium. You can take it or leave it."

"O. K., Martel," one of the men growled. "You win. We'll take it. When can we have a shipment?"

The war was definitely over.



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